# Kurukshetra University , Kurukshetra

## Scheme of Examination for Undergraduate Programme

## Subject: Yogic Science

**as per NEP 2020 Curriculum Framework for Undergraduate Programme (Multiple Entry-Exit, Internships and Choice Based Credit System implemented form session 2023-24**

| SEMESTER | Type of Course | COURSE CODE | PAPER/TITLE | CREDITS | | | Contact Hours (T+P) | Max. Marks | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Theory | Practical | Total | | Theory | | Practical | | Total |
| | | | | | | | | External | Internal | External | Internal | |
| 1 | Core Course - 1 | B23-YOG-101 | Fundamentals of Yoga | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| 2 | Core Course - 2 | B23-YOG -201 | Basic Humen Anatomy and Physiology | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| 3 | Core Course - 3 | B23-YOG -301 | Patanjali Yog Darshan | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| 4. | Core Course - 4 | B23-YOG -401 | Fundamentals of Hath Yoga | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| 5 | Core Course - 5 | B23-YOG -501 | Fundamentals of Naturopathy | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| 6 | Core Course - 6 | B23-YOG -601 | Principal Upanishads and Bhagavad Gita | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |

## 1st Semester Subject: Yogic Science
## (According to NEP2020 implemented from Session 2023 - 24)
# Core Course – 1

| Part A - Introduction | | | |
|---|---|---|---|
| Subject: | Yogic Science | | |
| Semester | 1st Semester | | |
| Name of the Course | Fundamentals of Yoga | | |
| Course Code | B23-YOG-101 | | |
| Course Type: | Core Course - 1 | | |
| Level of the Course | 100 - 199 | | |
| Pre-requisite (if any) | 12th pass from any streams (Arts/Science/ Commerce) preferable with Sports Background. It is open for all. | | |
| Course Learning Outcomes (CLOs): | After completing this course, the learner will be able to:<br>1. Describe the Aims, Objectives and scope of yoga.<br>2. Explain the different Yogic Texts, different types of yog and Ashtang yoga<br>3. Illustrate the contribution of different yogis in the development of yoga.<br>4. Tell the relationship of yoga with Health and significance of International Day of Yoga | | |
| | 5. Demonstrate Surya Namaskar, basic sitting and standing asanas | | |
| **Credits** | **Theory** | **Practical** | **Total** |
| | 3 | 1 | 4 |
| Contact Hours | 3 hours per week | 2 hours per week<br>(Size of practical group = 20 students) | 5 |
| **Max. Marks: 100**<br>**Part I - Theory = 70**<br>**(Internal Assessment - 20 Marks + End Term Exam – 50 Marks)**<br>**Part II - Practical = 30**<br>**(Internal Assessment - 10 Marks + End Term Exam – 20 Marks)** | | Time: 3 Hours<br><br>**For End Term Exam** | |

**Part B- Content of the Course**

**<u>Instructions for Paper- Setter</u>:**

The question paper will consist of Five Units I, II, III, IV and V. Units I, II, III & IV will have two questions from their respective Units of the Syllabus and will carry 10 marks each. Unit Vth will consist of 5 short answer type questions, which will cover the entire syllabus and will carry 2 marks for each question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Introduction of Physical Education:**<br>• Meaning and Definition of Yoga<br>• Aims and Objectives of Yoga<br>• The Yoga Sutra: General Consideration<br>• Need and Importance of Yoga in Modern Society<br>• Misconceptions about Yoga<br>• Career opportunities in Yoga | 11 |

| | | |
|---|---|---|
| II | **Schools of Yoga and its brief Introduction:**<br>• Yoga in different texts – Ved, Geeta and Upnishads.<br>• Different types of Yog – Hath Yog, Jnana Yoga, Bhakti Yog, Karm Yog, Mantra Yog & Raj Yog.<br>• Asthang Yog – Yam, Niyam, Asan, Pranayam, Pratyahar, Dharna, Dhyan & Smadhi.<br>• Elements of Yoga in Jainism and Buddhism. | 12 |
| III | **Introduction of Various Yogis:**<br>• Brief introduction and yogic contribution of Maharishi Dayananda Saraswati, Swami Vivekananda, Sri Aurobindo, Maharishi Raman and Swami Kuvalyananda<br>• Brief Introduction and contribution for the development and promotion of Yoga by Sri Shyamacharan Lahiri, Sri T. Krishnamacharya, Swami Shivanada Saraswati and Maharshi Mahesh Yogi | 12 |
| IV | **Health and International Day of Yoga:**<br>• Meaning, definition and various Dimensions of Health<br>• Relationship of Yoga and Health<br>• International Day of Yoga: Brief History, Resolution of United Nation General Assembly for International Day of Yoga<br>• Common Yoga Protocol (CYP) for Conducting International Day of Yoga<br>• Significance of International Day of Yoga at National and International Level. | 11 |

**Suggested Evaluation Methods:**

**Maximum Marks: 70 (Internal Assessment - 20 Marks + End Term Exam – 50 Marks)**

| | |
|---|---|
| **Internal Assessment: 20 Marks**<br>Continuous ComprehensiveEvaluation (CCE): 20 Marks<br>Class presentation = 5<br>Seminar/ Assignment/Quiz/class test, etc. = 5<br>Mid Term Test = 10 | **End Term Exam: 50 Marks** **Time = 3 hrs.**<br>One question of 10 marks from each Units I to IV = 40 Marks.<br>Five Questions short answer from entire syllabus = 5 × 2 Marks = 10 Marks**.** |

**Part II – Practical**
**(Internal Assessment - 10 Marks + External – 20 Marks)**

| Unit | Topics | Marks distribution | Contact Hours |
|---|---|---|---|
| I | Surya Namaskar with count and Mantra | 10 Marks | 10 |
| II | Ten Basic Asanas in Sitting and Lying posture | 10 Marks | 10 |
| III | Ten Basic Asanas in Standing posture | 10 Marks | 10 |
| | **Internal Assessment: 10 Marks**<br>Evaluation through Skill Test/ Assignments/ Quiz/ Viva Voce/ Practical Record File<br>(5 Marks for Each Game) | **End Term Exam: 20 Marks**<br>Evaluation through performance in Skill Test/ Demonstration/ Viva Voce/ Practical Record File<br>(10 Marks for Each Game) | |

## Part C-Learning Resources

- Suggested Readings:
  - Anand Omprarkash (2001). Yog Dawra Kaya Kalp, Kanpur. Sewasth Sahitya Perkashan
  - Iyengar, B.K.S. (1995). Light on Yoga : The Bible of Modern Yoga. Schocken

Publishers, USA.
- Kaminoff, L. et al (2007). Yoga Anatomy. Human Kinetics, USA.
- Kirk, M. (2005). The Hatha Yoga Illustrated. Human Kinetics, USA.
- Mukerji, A.P. (2010). The Doctorine and Practice of Yoga. General Books, LLC, New Delhi.
- Norton, W.W. (2010). Yoga for Osteoporosis : The Complete Guide. W.W. Norton & Company, USA.
- Sarin N (2003). Yoga Dawara Rogoon Ka Upchhar. Khel Sahitya Kendra
- Sri Swami Rama, (2001). Breathing. Rishikesh Sadhana Mandir Trust.
- Swami Ram (2000). Yoga & Married Life. Rishikesh Sadhana Mandir Trust
- Swami Swatma Ram: Patanjali Yoga Sutra
- Swami Veda Bharti (2000). Yoga Polity. Economy and Family. Rishikesh Sadhana Mandir Trust
- Text Book Hath Yoga Pradipika
- Text Book Patanjali Yoga Sutra

## 2nd Semester Subject: Yogic Science
## (According to NEP2020 implemented from Session 2023 - 24)
# Core Course – 2

| Part A - Introduction | | | |
|---|---|---|---|
| Subject: | **Yogic Science** | | |
| Semester | **2nd Semester** | | |
| Name of the Course | **Basic Anatomy and Physiology** | | |
| Course Code | B23- YOG -201 | | |
| Course Type: | Core Course - 2 | | |
| Level of the Course | 100 - 199 | | |
| Pre-requisite (if any) | Student who has opted Core Course of Yogic Science in 1st Semester | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Describe the Anatomy, Physiology and structure of Cells.<br>2. Explain the structure of Joints and Muscular System<br>3. Illustrate the basic knowledge about Anatomy, Physiology of Circulatory and Digestive Systems of human body<br>4. Explain the Anatomy, Physiology of Respiratory and Excretory Systems of human body | | |
| | 5. Identify name and locations of bones. Perform basic asanas in lying position and Pranayamas | | |
| **Credits** | **Theory** | **Practical** | **Total** |
| | 3 | 1 | 4 |
| Contact Hours | 3 hours per week | 2 hours per week<br>(Size of practical group = 20 students) | 5 |
| **Max. Marks: 100**<br>**Part I - Theory = 70**<br>**(Internal Assessment - 20 Marks + End Term Exam – 50 Marks)**<br>**Part II - Practical = 30**<br>**(Internal Assessment - 10 Marks + End Term Exam – 20 Marks)** | | Time: 3 Hours<br>**For End Term Exam** | |

**Part B- Content of the Course**

**Instructions for Paper- Setter:**

The question paper will consist of five Units I, II, III, IV and V. Units I, II, III & IV will have two questions from their respective Units of the Syllabus and will carry 10 marks each. Unit Vth will consist of 5 short answer type questions, which will cover the entire syllabus and will carry 2 marks for each question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Introduction of Anatomy and Physiology**<br>• Meaning and Definition of Anatomy and Physiology.<br>• Importance of Anatomy and Physiology in Yoga<br>• Cell: Structure, Properties and functions<br>• Meaning of Cell, Tissues, Organs and System.<br>• Bone: Meaning and types<br>• Skeletal System: Structure and functions of Skeletal System.<br>• Axial and Appendicular Skelton | 12 |

| | | |
|---|---|---|
| II | **Joints and Muscular System**<br>• Meaning of Joints, Types of Joints<br>• Types of Synovial Joints present in human body<br>• Meaning of Muscle, Types of muscles present in human body<br>• Gross Structure of Skeletal Muscle,<br>• Effect of Yogic Asanas on the Joints and Muscular System | 10 |
| III | **Circulatory System and Digestive System**<br>• Constituents of blood and Structure of the heart<br>• Types of Blood Circulation: Systemic, Pulmonary and Coronary,<br>• Digestive System: Organs, Structure and their functions<br>• Process of Food absorption, Name and functions of various digestive juices and enzymes<br>• Effect of Yogic Asanas and Paranayamas on circulatory system and digestive System | 12 |
| IV | **Respiratory System and Endocrine System**<br>• Organs of Respiratory system and their functions.<br>• Structure of Respiratory system<br>• Exchange of gases in the lungs and tissues,<br>• Various Endocrine Glands: Their Locations, Secretions and Functions<br>• Effect of Yogic Asanas and Paranayamas on Respiratory System and Endocrine System | 11 |

**Suggested Evaluation Methods:**

**Maximum Marks: 70 (Internal Assessment - 20 Marks + End Term Exam – 50 Marks)**

| | |
|---|---|
| **Internal Assessment: 20 Marks**<br>Continuous ComprehensiveEvaluation (CCE): 20 Marks<br>Class presentation = 5<br>Seminar/ Assignment/Quiz/class test, etc. = 5<br>Mid Term Test = 10 | **End Term Exam: 50 Marks** **Time = 3 hrs**<br>One question of 10 marks from each Units I to IV = 40 Marks.<br>Five Questions short answer from entire syllabus = 5 × 2 Marks = 10 Marks. |

**Part II – Practical**
**(Internal Assessment - 10 Marks + External – 20 Marks)**

| Unit | Topics | Marks distribution | Contact Hours |
|---|---|---|---|
| I | Identification of Name and location of Human Bones on Skelton and Chart | 10 Marks | 10 |
| II | Ten Basic Asanas of lying position | 10 Marks | 10 |
| III | Pranayama: Nadi Shodhan, , Bhastrika, Suryabhedhen, Sheetali, Sheetkari, Bhramari and Ujjayi | 10 Marks | 10 |
| | **Internal Assessment: 10 Marks**<br>Evaluation through Assignments/ Quiz/ Viva Voce/ Practical Record File | **University Exam (UE): 20 Marks**<br>Evaluation through Viva Voce/ Practical Record File: | |

## Part C-Learning Resources


- Gupta, A. P. (2010). Anatomy and physiology. Agra: Sumit Prakashan.
- Gupta, M. and Gupta, M. C. (1980). Body and anatomical science. Delhi: Swaran Printing Press.

- Guyton, A.C. (1996). Textbook of Medical Physiology, 9th edition. Philadelphia: W.B. Saunders.
- Moorthy, A. M. (2014). Anatomy physiology and health education. Karaikudi: Madalayam Publications.
- Pearce, E. C. (1962). Anatomy and physiology for nurses. London: Faber & Faber Ltd.
- Singh, S. (1979). Anatomy of physiology and health education. Ropar: Jeet Publications.
- Anand Omprarkash (2001). Yog Dawra Kaya Kalp, Kanpur. Sewasth Sahitya Perkashan
- Iyengar, B.K.S. (1995). Light on Yoga : The Bible of Modern Yoga. Schocken Publishers, USA.
- Kaminoff, L. et al (2007). Yoga Anatomy. Human Kinetics, USA.
- Kirk, M. (2005). The Hatha Yoga Illustrated. Human Kinetics, USA.
- Mukerji, A.P. (2010). The Doctorine and Practice of Yoga. General Books, LLC, New Delhi.
- Norton, W.W. (2010). Yoga for Osteoporosis : The Complete Guide. W.W. Norton & Company, USA.
- Sarin N (2003). Yoga Dawara Rogoon Ka Upchhar. Khel Sahitya Kendra
- Sri Swami Rama, (2001). Breathing. Rishikesh Sadhana Mandir Trust.
- Swami Ram (2000). Yoga & Married Life. Rishikesh Sadhana Mandir Trust

**B. Tech in Artificial Intelligence and Machine Learning**

**Scheme of Studies/Examination**

**Semester III**

**(w.e.f. session 2023-2024)**

| S. No. | Course No. | Subject | L:T:P | Hour/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC-AI-201A | Data Structure & Applications | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | PC-AI-203A | Introduction to Object oriented Programming | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | PC-AI-205A | Digital Electronics | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PC-AI-207A | Statistical Analysis for AI & ML | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5 | PC-AI-209A | Introduction to AI | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | HM-902A | Business Intelligence & Entrepreneurship | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 7 | PC-AI-211LA | Data Structure Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 8 | PC-AI-213LA | Object oriented Programming Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 9 | PC-AI-215LA | AI &ML workshop-I | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| | | **Total** | | **30** | **24** | **450** | **270** | **180** | **900** | |
| 11 | SIM-201A* | Seminar on Summer Internship | 2:0:0 | 2 | 0 | 0 | 50 | 0 | 50 | |

***Note: SIM-201A* is a mandatory credit-less course in which the students will be evaluated for the Summer Internship (training) undergone after 2nd semester and students will be required to get passing marks to qualify.**

1. Regarding the course SIM-201A* (Seminar on Summer Internship) is a part of the curriculum of B.Tech – 2nd Semester. Since the students are admitted directly through LEET (Lateral Entrance Examination Test) in the B.Tech. – 3rd Semester, therefore, they need not to undergothiscourse.
2. In the D.M.C for LEET students it may bementioned
   *NOT APPLICABLE
   * ADMITTED UNDER LEET

| PC-AI- 201A | Data Structure & Applications | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To introduce the principles and paradigms of Data Structures for design and implement the software systems logically and physically. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | To introduce the basic concepts of Data structure, basic data types, searching and sorting based on array data types. | | | | | | |
| **CO 2** | To introduce the structured data types like Stacks and Queue and its basic operations and implementation. | | | | | | |
| **CO 3** | To introduce dynamic implementation of linked list. | | | | | | |
| **CO 4** | To introduce the concepts of Tree and graph and implementation of traversal algorithms. | | | | | | |

## Unit-I

**Introduction to Data Structures**, Data Types, Built in and User Defined Data Structures, Applications of Data Structure, Algorithm Analysis, Worst, Best and Average Case Analysis, Notations of Space and Time Complexity, Basics of Recursion.

**Arrays**, One Dimensional Arrays, Two Dimensional Arrays and Multi-Dimensional Arrays, Sparse Matrices, searching from array using Linear and Binary Searching Algorithm, Sorting of array using Selection, Insertion, Bubble, RadixAlgorithm

## Unit-II

**Stacks**: Definition, Implementation of Stacks and Its Operations, Evaluation of Infix, prefix and Postfix Expression, Inter-conversion of Infix, Prefix and Post-Fix Expression, Implementation of Merge Sort and Quick Sort Algorithm.

**Queues**: Definition, Sequential Implementation of Linear Queues and Its Operations, Circular Queue and Its Implementation, Priority Queues and Its Implementation, Applications of queues.

## Unit-III

**Linked Lists**: Need of Dynamic Data Structures, Single Link List and Its Dynamic Implementation, Traversing, Insertion, Deletion Operations on Single Link Lists. Comparison between Static and Dynamic, Implementation of Linked List. Circular Link Lists and Doubly Link List, Dynamic Implementation of Primitive Operations on Doubly Linked Lists and Circular Link List. Dynamic Implementation of Stacks andQueues.

## Unit-IV

**Trees**: Definition, Basic Terminology, Binary Tree, External and Internal Nodes, Static and Dynamic Implementation of a Binary Tree, Primitive Operations on Binary Trees, Binary Tree Traversals: Pre-Order, In-Order and Post-Order Traversals. Representation of Infix, Post-Fix and Prefix Expressions using Trees. **Introduction to Binary Search Trees:** B+ trees, AVL Trees, Threaded Binary trees, Balanced Multi-way search trees, Implementation of Heap Sort Algorithm.

**Graphs**: Basic Terminology, Definition of Undirected and Directed Graphs, Memory Representation of Graphs, Minimum-Spanning Trees, Warshal Algorithm, Graph Traversals Algorithms: Breadth First and Depth First.

**Suggested books:**


1. Theory and Problems of Data Structures by Jr. SymourLipschetz, Schaum's outline,TMH.
2. Data Structures and Algorithms by PAI,TMH.
3. Fundamentals of Data structures by Ellis Horowitz and Sartaj Sahni, Pub, 1983,AW.
4. Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low PricedEdition.
5. Data Structures and Program Design in C by Robert Kruse, PHI.
6. Shukla, Data Structures using C++, WileyIndia

7. Introduction to Computers Science -An Algorithms Approach, Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
8. Data Structure and the Standard Template library – William J. Collins, 2003,T.M.H.

| PC-AI- 203A | Introduction to Object-Oriented Programming | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | To introduce the principles and paradigms of Data Structures for design and implement the software systems logically and physically. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | To introduce the basic concepts of object-oriented programming language and the its representation. | | | | | | |
| **CO 2** | To allocate dynamic memory, access private members of class and the behavior of inheritance and its implementation. | | | | | | |
| **CO 3** | To introduce polymorphism, interface design and overloading of operator. | | | | | | |
| **CO 4** | To handle backup system using file, general purpose template and handling of raised exception during programming. | | | | | | |

**Unit–I**

Introduction to C++, C++ Standard Library, Illustrative Simple C++ Programs. Header Files, Namespaces, Application of object-oriented programming.

Object Oriented Concepts, Introduction to Objects and Object-Oriented Programming, Encapsulation, Polymorphism, Overloading, Inheritance, Abstract Classes, Access modifiers (public/ protected/ private), Class Scope and Accessing Class Members, Controlling Access Function, Constant, Class Member, Structure and Class.

**Unit-II**

Friend Function and Friend Classes, This Pointer, Dynamic Memory Allocation and Deallocation (New and Delete), Static Class Members, Constructors, Parameter Constructors and Copy Constructors, Destructors, Introduction of inheritance, Types of Inheritance, Overriding Base Class Members in a Derived Class, Public, Protected and Private Inheritance, Effect of Constructors and Destructors of Base Class in DerivedClasses.

**Unit-III**

Polymorphism, Pointer to Derived class, Virtual Functions, Pure Virtual Function, Abstract Base Classes, Static and Dynamic Binding, Virtual Destructors.

Fundamentals of Operator Overloading, Rules for Operators Overloading, Implementation of Operator Overloading Like <<,>> Unary Operators, Binary Operators.

**Unit-IV**

Text Streams and binary stream, Sequential and Random-Access File, Stream Input/ Output Classes, Stream Manipulators.

Basics of C++ Exception Handling, Try, Throw, Catch, multiple catch, Re-throwing an Exception, Exception specifications.

Templates: Function Templates, Overloading Template Functions, Class Template, Class Templates and Non- Type Template arguments.

**Suggested books:**

1. The complete reference C ++ by Herbert shield Tata McGrawHill.
2. Object Oriented Programming in Turbo C++ by Robert Lafore, 1994, The WAITE GroupPress.
3. Shukla, Object Oriented Programming in c++, WileyIndia.
4. C++ How to Program by H M Deitel and P J Deitel, 1998, PrenticeHall.
5. Programming with C++ By D Ravichandran, 2003,T.M.H.

| PC-AI-205A | Digital Electronics | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To learn the basic methods for the design of digital circuits and provide the fundamental concepts used in the design of digitalsystems. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To introduce basic postulates ofBoolean algebra and shows the correlation between Booleanexpressions | | | | | | |
| **CO2** | To introduce the methods for simplifying Boolean expressions | | | | | | |
| **CO3** | To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits | | | | | | |
| **CO4** | To introduce the concept of memories and programmable logic devices. | | | | | | |

## UNIT I

**MINIMIZATION TECHNIQUES AND LOGIC GATES:** Binary Digits, Logic Levels, and Digital waveforms, Logic Systems-Positive and negative, Logic Operations, Logical Operators, Logic Gates-AND, OR, NOT, NAND, NOR, Exclusive-OR and Exclusive-NOR, Active high and Active low concepts, Universal Gates and realization of other gates using universal gates, Gate Performance Characteristics and Parameters. Boolean Algebra: Rules and laws of Boolean algebra, Demorgan's Theorems, Boolean Expressions and Truth Tables, Standard SOP and POS forms; Minterm and Maxterms, Canonical representation of Boolean expressions, Duality Theorem, Simplification of Boolean Expressions, Minimization Techniques for Boolean Expressions using Karnaugh Map and Quine McCluskey Tabular method.

## UNIT II

**COMBINATIONAL CIRCUITS:** Introduction to combinational Circuits, Adders-Half-Adder and Full-Adder, Subtractors- Half and Full Subtractor; Parallel adder and Subtractor; Look-Ahead Carry Adders. BCD adder, BCD subtractor, Parity Checker/Generator, Multiplexer, Demultiplexer, Encoder, Priority Encoder; Decoder, BCD to Seven segment Display Decoder/Driver, LCD Display, andComparators.

## UNIT III

**SEQUENTIAL CIRCUITS:** Introduction to Sequential Circuits, Flip-Flops: Types of Flip Flops -RS, T, D, JK; Edge triggering, Level Triggering; Flip Flop conversions; Master-Salve JK. Introduction to shift registers, Basic Shift Register Operations, types of shift registers, Bidirectional Shift Registers, Shift Register Counters. Introduction to counters, Types of Counters-Asynchronous and synchronous counters, Up/Down Synchronous Counters, Modulo-n Counter, State table, excitation table concepts, Design of asynchronous and synchronous counters, Ring Counter, Applications ofcounters.

## UNIT IV

**CONVERTER AND MEMORY DEVICES**: Digital to Analog Converter, Weighed Register: R-2R Ladder Network: Analog to Digital Conversion, Successive Approximation Type, Dual Slope Type. Classification of memories - ROM: ROM organization, PROM, EPROM, EEPROM, EAPROM, RAM: - RAM organization - Write operation, Read operation, Memory cycle, Timing wave forms, memory expansion, Static RAM Cell, MOSFET RAM cell structure, Dynamic RAM cell structure, Programmable Logic Devices - Programmable Logic Array (PLA), Programmable Array Logic (PAL), Implementation of PLA, PAL using ROM.

**Suggested Books:**


1. Donald P. Leach and Albert Paul Melvino, Digital Principles and Applications, 8th Edition, TMH, 2003.M.
2. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003 / Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.
3. ALI, Digital Switching Systems, ,TMH
4. A.K. Maini, Digital Electronics, WileyIndia
5. John F. Wakerly, Digital Design, Fourth Edition, Pearson/PHI,2006
6. John. M Yarbrough, Digital Logic Applications and Design, Thomson Learning,2002.
7. S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, 3rd Edition., Vikas Publishing House Pvt. Ltd, New Delhi,2006
8. William H. Gothmann, Digital Electronics, 2nd Edition, PHI,1982.
9. Thomas L. Floyd, Digital Fundamentals, 8th Edition, Pearson Education Inc, New Delhi,2003
10. Donald D. Givone, Digital Principles and Design, TMH,2003.

| PC-AI- 207A | Statistical Analysis for AI & ML | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To gain a broad understanding of the statistical analysis in Artificial Intelligence. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | To study the Statistical Analysis concepts with their relationships and process. | | | | | | |
| **CO 2** | To familiarize with describing data, transforming, and summarizing. | | | | | | |
| **CO 3** | To understand testing hypothesis with real time applications. | | | | | | |
| **CO 4** | To apply the examining relationships to find the correlation and regression. | | | | | | |

**UNIT – I**

Introduction, Meaning of Statistics, The Scientific Method, Basic Steps of the Research Process, Experimental Data and Survey Data, Populations and Samples, Census and Sampling Method, Parameter and Statistic, Independent and Dependent Variables, Examining Relationships, Introduction to SPSS Statistics.

**UNIT – II**

Introduction, Types of Data, Data Transformation, Summarizing Data: Graphical Methods, Summarizing Data: Measures of Central Tendency, Summarizing Data: Measures of Dispersion, Levels of Measurement, Random Variables and Probability Distributions, Discrete and Continuous Random Variable, Making Inferences about Populations from samples, Estimator and Estimate, Confidence Interval for Population Mean (Large Sample).

**UNIT – III**

Introduction, Null and Alternative Hypothesis, Type I and Type II Error, The Procedure of Hypothesis Testing; Hypothesis Testing of a Population Mean: Sample, Proportion(One Sample), Population Variance, Population Mean: Two Independent Samples(), Dependent Samples (Paired Samples), Two Population Proportion, Two Population Variances; Analysis of Variance(ANOVA).

**UNIT – IV**

Introduction, Types of Correlation, Karl Pearson Coefficient Correlation, Spearman's Rank Order Correlation, Partial Correlation, Residuals and Plots, Simple Linear Regression, Multiple Regression Model, Repeated Measures, Non-linear Regression, Polynomial Regression Models, Decision Trees, Neural Networks, Cluster Analysis, FactorAnalysis.

**Suggested books:**


1. Probability for Statistics and Machine Learning: Anirban DasGupta -2011
2. An Introduction to Statistics with Python with Applications in the Life Sciences By Thomas Haslwanter,2016
3. Applied Statistics: A handbook of techniques- Zenon Reynarowych, springerverlag
4. Joel Grus, "Data Science from Scratch: First Principles with Python", O'Reilly MediaMedia.
5. Jain V.K., "Data Sciences", Khanna Publishing House,Delhi.
6. Applied Statistics-principles and Examples-D.R.Cox and E.J.Snell.
7. Applied statiscal methods, Irving W. Burr, Academicpress.
8. Probability, Statistics and Random process, Dr.K.Murugesan&P.Gurusamy by Anuradha Agencies, Deepthi publications.
9. Jain V.K., "Big Data and Hadoop", Khanna Publishing House,Delhi.
10. Jiawei Han and Jian Pei, "Data Mining Concepts and Techniques", Third Edition, Morgan Kaufmann Publishers.

| PC-AI- 209A | Introduction to AI | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To gain a broad understanding of the discipline of Artificial Intelligence and its scope in various emerging areas. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | Demonstrate fundamental understanding of Artificial Intelligence (AI) and its foundation | | | | | | |
| **CO 2** | Demonstrate basic concepts of problem solving, searching, inference, perception | | | | | | |
| **CO 3** | Demonstrate proficiency in applying AI techniques in various domains | | | | | | |
| **CO 4** | Apply basic principles of AI in solutions that require real world knowledge representation and learning. | | | | | | |
| **CO5** | Demonstrate the real life examples of Artificial Intelligence. | | | | | | |
| **CO6** | Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications | | | | | | |

**UNIT – I**

**Scope of AI**: Introduction to Artificial Intelligence, History of Artificial Intelligence, Artificial Intelligence Languages, Multi Agent Systems, natural language processing, vision and speech processing, robotics, expert systems, Case study: Google Duplex, Dialog flow.

**UNIT – II**

**Problem Solving, Searching and Planning**: Problem spaces and search, Heuristic and Informed search strategies, Minmax search, Alpha-beta pruning.

Search and optimization (gradient descent), Adversarial search, Planning and scheduling, Case study: Health CareSystem.

**UNIT – III**

**Knowledge Engineering, Representation, Reasoning and finding Optimal Paths:** Knowledge and Knowledge based system, Knowledge and rationality, Logic and inference, Propositional and predicate logic, Ontologies, Bayesian Reasoning, Temporal reasoning, Knowledge Discovery: Data and Web Mining Case study: Medical diagnosis .

**UNIT – IV**

**Applications of AI in Various domains:** AI in Marketing, AI in Banking, AI in Finance, AI in Agriculture, AI in Health Care, AI in Gaming, AI in Space Exploration, AI in Autonomous vehicles, AI in Chatbots, AI inCreativity.

**Suggested books:**


1. E. Rich and K. Knight, “Artificial Intelligence”, TMH, 2nd Ed.,1992.
2. N. J. Nilsson, “Principles of AI”,Narosa Publ. House,1990.
3. M. N. Hoda, “Foundation Course in Artificial Intelligence”, Vikas Pub.,2004.
4. Artificial Intelligence“ RBMishra,PHI
5. Knowledge and Knowledge based System“Russell.
6. Artificial intelligence, Patrick Henry Winston: 1992, Addition Wesley 3Ed.
7. Stuart Russell and Peter Norvig, “Artificial Intelligence: A Modern Approach” , 3rd Edition, Prentice Hall.
8. P. H. Winston, "Artificial Intelligence", Pearson Education, 3rd Edition, 2002. ArtificialIntelligence.
9. D. W. Patterson, “Introduction to AI and Expert Systems”, PHI,1992.
10. R. J. Schalkoff, “Artificial Intelligence – An Engineering Approach”, McGraw Hill Int. Ed. Singapore, 1992.
11. M. Sasikumar, S. Ramani, “Rule Based Expert Systems”,Narosa Publishing House, 1994. 5. Tim

Johns, “Artificial Intelligence, Application Programming, Wiley Dreamtech,2005.
12. Trivedi, M.C., “A Classical Approach to Artificial Intelligence”, Khanna Publishing House,Delhi.
13. Saroj Kaushik, “Artificial Intelligence”, Cengage Learning India,2011.
14. David Poole and Alan Mackworth, “Artificial Intelligence: Foundations for Computational Agents”, Cambridge University Press2010.

| HM-902A | Business Intelligence and Entrepreneurship | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To make the students conversant with the basics concepts in management thereby leading to nurturing their managerial skills. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Students will be able understand who the entrepreneurs are and what competences needed to become an entrepreneur. | | | | | | |
| **CO2** | Students will be able understand insights into the management, opportunity search, identification of a Product; market feasibility studies; project finalization etc. required for small businessenterprises. | | | | | | |
| **CO3** | Students can be able to write a report and do oral presentation on the topics such as product identification, business idea, export marketing etc. | | | | | | |
| **CO4** | Students will be able to know the different financial and other assistance available for the small industrial units. | | | | | | |

**UNIT – I**

**Entrepreneurship:** Concept and Definitions; Entrepreneurship and Economic Development; Classification and Types of Entrepreneurs; Entrepreneurial Competencies; Factor Affecting Entrepreneurial Growth – Economic, Non-Economic Factors; EDP Programs; Entrepreneurial Training; Traits/Qualities of an Entrepreneurs; Manager Vs. Entrepreneur, Entrepreneurial challenges.

**UNIT – II**

**Opportunity / Identification and Product Selection:** Entrepreneurial Opportunity Search and Identification; Criteria to Select a Product; Conducting Feasibility Studies; Sources of business ideas, Marketing Plan : Conducting of Marketing Research, Industry Analysis, Competitor analysis, market segmentation and positioning, building a marketing plan, marketing mix, launching a new product; export marketing, Methods of Project Appraisal, Project Report Preparation; Specimen of Project Report; Project Planning and Scheduling using Networking Techniques of PERT /CPM.

**UNIT – III**

**Small Enterprises and Enterprise Launching Formalities:** Definition of Small Scale; Rationale; Objective; Scope; SSI; Registration; NOC from Pollution Board; Machinery and Equipment Selection , Role of SSI in Economic Development of India; major problem faced by SSI,MSMEs – Definition and Significance in IndianEconomy; MSME Schemes, Challenges and Difficulties in availing MSMESchemes.

**UNIT – IV**

**Role of Support Institutions and Management of Small Business:** DIC; SIDO; SIDBI; Small Industries Development Corporation (SIDC); SISI; NSIC; NISBUD; State Financial Corporation SIC; Venture Capital: Concept, venture capital financing schemes offered by various financial institutions in India. **Special Issues for Entrepreneurs**: Legal issues – Forming business entity, requirements for formation of a Private/Public Limited Company, Entrepreneurship and Intellectual Property Rights: IPR and their importance. (Patent, Copy Right, Trademarks) , Case Studies-At least one in wholecourse.

**Note:**

• Case studies of Entrepreneurs – successful, failed, turnaround ventures should be discussed in theclass.

• Exercises / activities should be conducted on „generating business ideas" and identifying problems and opportunities.

• Interactive sessions with Entrepreneurs, authorities of financial institutions, Government officials should be organized

**Suggested books:**

1. “Entrepreneurship development small business enterprises”, Pearson, Poornima MCharantimath,2013.
2. Roy Rajiv, “Entrepreneurship”, Oxford University Press, 2011.
3. “Innovation and Entrepreneurship”, Harper business- Drucker, Peter,2006.
4. “Entrepreneurship”, Tata Mc-graw Hill Publishing Co. Ltd New Delhi- Robert D. Hisrich, Mathew J. Manimala, Michael P Peters and Dean A. Shepherd, 8th Edition,2012.
5. Enterpreneurship Development- S.Chand and Co.,Delhi- S.S.Khanka1999
6. Small-Scale Industries and Entrepreneurship. Himalaya Publishing House, Delhi –Vasant Desai2003.
7. Entrepreneurship Management -Cynthia, Kaulgud, Aruna, Vikas Publishing House, Delhi,2003.

| PC-AI-211LA | Data Structure Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **4** | **2** | **40** | **60** | **100** | **3 Hour** |
| **Purpose** | To introduce the principles and paradigms of Data Structures for design and implement the software systems logically and physically. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Implement linear and nonlinear data structures using linked list. | | | | | | |
| **CO2** | Apply various data structures such as stack, queue, and tree to solve the problems. | | | | | | |
| **CO3** | Implement various searching and sorting techniques. | | | | | | |
| **CO4** | Choose appropriate data structure while designing the applications and analyze the complexity of the algorithms. | | | | | | |

## LIST OF PRACTICALS

1. Write a program for Binary searchmethods.
2. Write a program for insertion sort, selection sort and bubblesort.
3. Write a program to implement Stack and itsoperation.
4. Write a program for quicksort.
5. Write a program for mergesort.
6. Write a program to implement Queue and itsoperation.
7. Write a program to implement Circular Queue and itsoperation.
8. Write a program to implement singly linked list for the following operations: Create, Display, searching, traversing anddeletion.
9. Write a program to implement doubly linked list for the following operations: Create, Display, inserting, counting, searching, traversing anddeletion.
10 Write a program to implement circular linked list for the following operations: Create, Display, inserting, counting, searching, traversing anddeletion.
11. Write a program to implement insertion, deletion and traversing in B tree

**NOTE:A student has to perform at least ten experiments. Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.**

| PC-AI-213LA | Object Oriented Programming Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **4** | **2** | **40** | **60** | **100** | **3 Hour** |
| **Purpose** | To introduce the principles and paradigms of Object Oriented Programming Language for design and implement the Object Oriented System. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To familiarize with the class and objects | | | | | | |
| **CO2** | To implement the concept of constructors | | | | | | |
| **CO3** | To familiarize the concept of operator overloading | | | | | | |
| **CO4** | To implement the concepts of Inheritance | | | | | | |

## LIST OF PRACTICALS

**1.** Raising a number n to a power p is the same as multiplying n by itself p times. Write a function called power( ) that takes a double value for n and an int value for p, and returns the result as double value. Use a default argument of 2 for p, so that if this argument is omitted, the number will be squared. Write a main ( ) function that gets values from the user to test thisfunction.

**2.** A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example, (4,5) represents a point 4 units to the right of the origin along the X axis and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of the X coordinates of the points and whose Y coordinate is the sum of their Y coordinates. Write a program that uses a structure called point to model a point. Define three points, and have the user input values to two of them. Then set the third point equal to the sum of the other two, and display the value of the new point. Interaction with the program might look like this:

Enter coordinates for P1: 3 4

Enter coordinates for P2: 5 7

Coordinates of P1 + P2 are : 8, 11

**3.** Create the equivalent of a four function calculator. The program should request the user to enter a number, an operator, and another number. It should then carry out the specified arithmetical operation: adding, subtracting, multiplying, or dividing the two numbers. (It should use a switch statement to select the operation). Finally it should display the result. When it finishes the calculation, the program should ask if the user wants to do another calculation. The response canbe „Y‟ or „N‟. Some sample interaction with the program might look like this.

Enter first number, operator, and second number: 10/ 3

Answer = 3.333333

Do another (Y/ N)? Y

Enter first number, operator, second number 12 + 100

Answer = 112

Do another (Y/ N) ? N

**4.** A phone number, such as (212) 767-8900, can be thought of as having three parts: the area code (212), the exchange (767) and the number (8900). Write a program that uses a structure to store these three parts of a phone number separately. Call the structure phone. Create two structure variables of type phone. Initialize one, and have the user input a number for the other one. Then display both numbers. The interchange might look likethis:

· Enter your area code, exchange, and number: 415 555 1212

· My number is (212) 767-8900

· Your number is (415) 555-1212

**5.** Create two classes DM and DB which store the value of distances. DM stores distances in metres and centimeters and DB in feet and inches. Write a program that can read values for the class objects and add one object of DM with another object of DB. Use a friend function to carry out the addition operation. The object that stores the results maybe a DM object or DB objects, depending on the units in which the results are required. The display should be in the format of feet and inches or meters and centimeters depending on the object on display.

**6.** Create a class rational which represents a numerical value by two double values- NUMERATOR and DENOMINATOR. Include the following public member Functions:

• constructor with no arguments(default).

• constructor with two arguments.

• void reduce( ) that reduces the rational number by eliminating the highest common factor between the numerator and denominator.

• Overload + operator to add two rational number.

• Overload >> operator to enable input throughcin.

• Overload << operator to enable output through cout.

Write a main ( ) to test all the functions in theclass.

**7.** Consider the following class definition

```
class father{
protected : int age;
public;
father (int x) {age = x;}
virtual void iam( )
{ cout<< "I AM THE FATHER, my age is : "<< age<< end1:}
```

Derive the two classes son and daughter from the above class and for each, define iam( ) to write our similar but appropriate messages. You should also define suitable constructors for these classes. Now, write a main ( ) that creates objects of the three classes and then calls iam ( ) for them. Declare pointer to father. Successively, assign addresses of objects of the two derived classes to this pointer and in each case, call iam ( ) through the pointer to demonstrate polymorphism in action.

**8.** Write a program that creates a binary file by reading the data for the students from the terminal. The data of each student consist of roll no., name ( a string of 30 or lesser no. of characters) and marks.

**9.** A hospital wants to create a database regarding its indoor patients. The information to store include

a) Name of thepatient

b) Date ofadmission

c) Disease

d) Date ofdischarge

Create a structure to store the date (year, month and date as its members). Create a base class to store the above information. The member function should include functions to enter information and display a list of all the patients in the database. Create a derived class to store the age of the patients. List the information about all the to store the age of the patients. List the information about all the pediatric patients (less than twelve years inage).

**10.** Make a class **Employee** with a name and salary. Make a class **Manager** inherit from **Employee**. Add an instance variable, named department, of type string. Supply a method to **to String** that prints the manager"s name, department and salary. Make a class **Executive** inherits from **Manager**. Supply a method **to String** that prints the string **"Executive"** followed by the information stored in the **Manager** superclass object. Supply a test program that tests these classes andmethods.

**11.** Imagine a tollbooth with a class called toll Booth. The two data items are a type unsigned int to hold the total number of cars, and a type double to hold the total amount of money collected. A constructor initializes both these to 0. A member function called payingCar( ) increments the car total and adds 0.50 to the cash total. Another function, called nopayCar( ), increments the car total but adds nothing to the cash total. Finally, a member function called displays the two totals. Include a program to test this class. This program should allow the user to push one key to count a paying car, and another to count a nonpaying car. Pushing the ESC kay should cause the program to print out the total cars and total cash and thenexit.

**12.** Write a function called reversit( ) that reverses a string (an array of char). Use a for loop that

swaps the first and last characters, then the second and next to last characters and so on. The string should be passed to reversit( ) as an argument. Write a program to exercise reversit( ). The programshouldgetastringfromtheuser,callreversit(),andprintouttheresult.Useaninput method that allows embedded blanks. Test the program with Napoleon"s famous phrase, "Able was I ere I sawElba)".

**13.** Create some objects of the string class, and put them in a Deque-some at the head of the Deque and some at the tail. Display the contents of the Deque using the forEach( ) function and a user written display function. Then search the Deque for a particular string, using the first That ( ) function and display any strings that match. Finally remove all the items from the Deque using the getLeft( ) function and display each item. Notice the order in which the items are displayed: Using getLeft( ), those inserted on the left (head) of the Deque are removed in "last in first out" order while those put on the right side are removed in "first in first out" order. The opposite would be true if getRight ( ) wereused.

**14.** Assume that a bank maintains two kinds of accounts for customers, one called as savings account and the other as current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge isimposed.

Create a class account that stores customer name, account number and type of account. From this derive theclasses

cur_acct and sav_acct to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks:

a) Accept deposit from a customer and update thebalance.

b) Display thebalance.

c) Compute and depositinterest.

d) Permit withdrawal and update thebalance.

e) Check for the minimum balance, impose penalty, necessary and update the balance. f) Do not use any constructors. Use member functions to initialize the classmembers.

**15.** Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get_data( ) to initialize baseclass data members and another member function display_area( ) to compute and display the area of figures. Make display_area( ) as a virtual function and redefine this function in the derived classes to suit their requirements. Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively and display thearea.

Remember the two values given as input will be treated as lengths of two sides in the case of rectangles and as base and height in the case of triangles and used as follows:

Area of rectangle = x * y

Area of triangle = ½ * x * y

**NOTE: A student has to perform at least ten experiments. Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.**

| PC-AI-215LA | AI & ML Workshop - I | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **4** | **2** | **40** | **60** | **100** | **3 Hour** |
| **Purpose** | To implement the basic concepts of Python language as well as basic concepts of data quality management using Python. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To learn the basics of Python Language. | | | | | | |
| **CO2** | To learn the data types of python. | | | | | | |
| **CO3** | To learn different packages of python. | | | | | | |
| **CO4** | To learn the data quality management in python. | | | | | | |

**LIST OF PRACTICALS**

1. Installation of Python, and learning interactively at command prompt and writing simpleprograms.
2. Learning the conditions and iterations in Python by writing and running simple prog
3. Random number generations, and problems based on random numbers
4. Handling tuples and exercises based ontuples.
5. Text processing using python
6. Write a program for defining Array usingNumPy.
7. Write a program to Create data frames in python using Pandas Package and implement its features, how to read csvfile.
8. Write a program for Data cleaning usingpandas.
9. Write a program for data visualization using matplotlib and seabornlibrary.
10. Write a program for classification of an object by implementingscikit-library.

**NOTE: A student has to perform at least ten experiments. Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.**

**B. Tech in Artificial Intelligence and Machine Learning**

**Scheme of Studies/Examination**
**Semester IV**
**(w.e.f. session 2023-2024)**

| S. No. | Course No. | Subject | L: T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC-AI-202A | Programming Language | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | PC-AI-204A | Operating Systems | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | PC-AI-206A | Database Management System | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PC-AI-208A | Intelligent Systems | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5 | PC-AI-210A | Machine Learning | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | PC-AI-212LA | Operating Systems Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 7 | PC-AI-214LA | Database Management System Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 8 | PC-AI-216LA | AI & ML workshop-II | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| | | **Total** | | **27** | **21** | **375** | **245** | **180** | **800** | |
| 9 | MC-901A | Environment Sciences | 3:0:0 | 3 | 0 | 75 | 25 | 0 | 100 | 3 |

***MC-901A is a mandatory credit-less course and student has to get passing marks in order to qualify for the award of B.Tech. Degree.**

| PC-AI -202A | Programming Language | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To introduce the principles and paradigms of programming languages for design and implement the software intensive systems. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | To introduce the basic concepts of programming language, the general problems and methods related to syntax and semantics. | | | | | | |
| **CO 2** | To introduce the structured data objects, subprograms and programmer defined data types. | | | | | | |
| **CO 3** | To outline the sequence control and data control. | | | | | | |
| **CO 4** | To introduce the concepts of storage management using programming languages. | | | | | | |

## Unit-I

**Introduction, Syntax and Semantics:** A brief history, Characteristics of a good programming language, Programming language translators- compiler and interpreters, Elementary data types – data objects, variable and constants, data types. Specification and implementation of elementary data types, Declarations, type checking and type conversions, Assignment and initialization, Numeric data types, enumerations, Booleans, and characters.

**SyntaxandSemantics:**Introduction,generalproblemofdescribingsyntax,FormalmethodofdescribingSyntax, attribute grammar dynamicsemantic.

## Unit-II

**Structured data objects, Subprograms and Programmer Defined Data Types:** Structured data objects and data types, specification and implementation of structured data types, Declaration and type checking of data structure, vector and arrays, records Character strings, variable size data structures, Union, pointer and programmer defined data objects, sets, files.

**Subprograms and Programmer Defined Data Types:** Evolution of data type concept, abstraction, encapsulation and information hiding, Subprograms, type definitions, abstract data types, over loaded subprograms, generic subprograms.

## Unit-III

**Sequence Control and Data Control:** Implicit and explicit sequence control, sequence control within expressions, sequence control within statement, Subprogram sequence control: simple call return, recursive subprograms,Exception,andexceptionhandlers,coroutines,sequencecontrol.Concurrency–subprogramlevel concurrency, synchronization through semaphores, monitors and message passing.

**Data Control:** Names and referencing environment, static and dynamic scope, block structure, Local data and local referencing environment, Shared data: dynamic and static scope, Parameter, and parameter transmission schemes.

## Unit-IV

**Storage Management and Programming Languages:** Major run time elements requiring storage,programmer and system-controlled storage management and phases, Static storage management, Stack based storage management, Heap storage management, variable and fixed sizeelements.

**ProgrammingLanguages:**Introductiontoprocedural,non-procedural,structured,logical,functionalandobject-oriented programming language, Comparison of C and C++ programminglanguages.

**Suggested books:**


1. Terrence W. Pratt, Marvin V. Zelkowitz, Programming Languages Design and Implementation,Pearson.
2. Allen Tucker and Robert Noonan, Programming Languages–Principles and Paradigms, Tata McGraw Hill, 2009.
3. Ellis Horowitz, Fundamentals of Programming Languages, Galgotia Publications,2010.
4. C. Ghezzi, Programming Languages Concepts, Wiley Publications,2010.

| PC-AI-204A | Operating System | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To familiarize the students with the basics of Operating Systems. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To understand the structure and functions of Operating system. | | | | | | |
| **CO2** | To learn about processes, threads, and scheduling algorithms. | | | | | | |
| **CO3** | To understand the principle of concurrency and the concept of deadlocks. | | | | | | |
| **CO4** | To understand various memory management scheme and to study I/O management and file systems. | | | | | | |

**Unit-I**

**Introduction:** Introduction to OS. Operating system functions, Different types of O.S.: batch process, multi programmed, time-sharing, real-time, distributed, parallel.

**System Structure:** Computer system operation, I/O structure, storage structure, storage hierarchy, different types of protections, operating system structure (simple, layered, virtual machine), O/S services, system calls.

**Unit-II**

**CPU scheduling:** scheduling criteria, preemptive and non-preemptive scheduling, scheduling algorithms, algorithm evaluation, multi-processor scheduling.

**Threads:** overview, benefits of threads, user and kernel threads.

**Process Management:** Concept of processes, process states, process control, co-operating processes, inter process communication.

**Process Synchronization:** background, critical section problem, critical region, synchronization hardware, Classical problems of synchronization, semaphores.

**Unit-III**

**Deadlocks:**Conceptofdeadlock,deadlockcharacterization,deadlockprevention,deadlockavoidance,deadlock detection, recovery fromdeadlock.

**Memory Management:** background, logical vs. physical address space, contiguous memory allocation, paging, segmentation, segmentation with paging, Concept of fragmentation.

**Virtual Memory:** background, demand paging, concept of page replacement, page replacement algorithms, allocation of frames, thrashing.

**Unit-IV**

**File Systems:** file concept, file organization and access methods, allocation methods, directory structure, free-space management

**I/O Management:** I/O hardware, polling, interrupts, DMA, kernel I/O subsystem (scheduling, buffering, caching, spooling and device reservation)

**Disk Management:** disk structure, disk scheduling (FCFS, SSTF, SCAN, C-SCAN) , disk reliability, disk Performance parameters

**Protection and Security:** Goals of protection and security, security attacks, authentication, program threats, system threats, threat monitoring.

**Case studies:** UNIX file system, Windows file system.

**Suggested Books:**


1. Operating System Concepts", Abraham Silberschatz, Peter Baer Galvin, and Greg Gagne,Wiley
2. Operating systems: a concept based approach", Dhananjay M. Dhamdhere, McGraw Hill .
3. Operating Systems : Internals and Design Principles, William Stallings,Pearson
4. Operating Systems Design and Implementation" ,(Prentice Hall Software Series) Andrew STanenbaum

and Albert SWoodhull.
5. Taub and Schilling, Principles of Communication Systems,TMH.
6. Mithal G K, Radio Engineering, KhannaPub.
7. Sirnon Haykin, Communication Systems, JohnWiley.

| PC-AI-206A | Database Management System | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To familiarize the students with Data Base Management system | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO 1** | To provide introduction to relational model and ER diagrams. | | | | | | |
| **CO 2** | To realize about Query Processing and Transaction Processing. | | | | | | |
| **CO 3** | To comprehend about the concept of functional dependencies. | | | | | | |
| **CO 4** | To learn the concept of failure recovery and concurrency control. | | | | | | |

## UNIT I

**Introduction:** Concept & Overview of DBMS, Data Models-, Network, Hierarchical and Relational Model, Levelsofabstraction.Administrator,DatabaseUsers,ThreeSchemaarchitectureofDBMS,Application.**Entity-RelationshipModel:**Entities,AttributesandEntitySets,RelationandRelationshipssets,MappingConstraints, Keys, Entity-Relationship Diagram, Weak Entity Sets, Extended E-Rfeatures.

## UNIT II

**Relational Model:** Structure of relational Databases, Relational Algebra and Relational Calculus, Operations on Relational Algebra, Operations on Relational Calculus, Tuple Relational Calculus, Domain Relational Calculus.
**SQL and Integrity Constraints:** Concept of DDL, DML, DCL. Basic Structure, set operations, Aggregate Functions, Null Values, Domain Constraints, Referential Integrity Constraints, assertions, Introduction to views, Querying, Nested Sub queries, Database security application development using SQL, Stored procedures and triggers.

## UNIT III

**Relational Database Design:**
Functional Dependency, Different anomalies in designing a Database., Normalization using functional dependencies,Decomposition,Boyce-CoddNormalForm,3NF,Normalizationusingmulti-valueddependencies, 4NF,5NF.
**Internals of RDBMS:** Physical data structures, Query optimization: join algorithm, statistics, and cost base optimization. Transaction processing, Concurrency control and Recovery Management: transaction model properties, state serializability, lock base protocols, two phase locking.

## UNIT IV

**Recovery System:** Types of Failures, Recovery Techniques, ARIES.
**Concurrency Control:** Serial and Serializable Schedules-Conflict Serializability –Enforcing Serializability by Locks-LockingSystemswithSeveralLockModes-ConcurrencyControlbyTimestamps,validation.
**Transaction Management:** ACID Properties, Transaction states, Serializability and Recoverability-View, Serializability- Resolving Deadlocks-Distributed Databases: Commit andLock

**Suggested Books**:


1. RamezElmasri,ShamkantB.Navathe,”Fundamentals of Database systems”,Pearson
2. Korth, Silberschatz, Sudarshan: database concepts, MGH,
3. R. Ramakrishnan and J. Gehrks database management system; MGH, Internationaledition,
4. C. J. Date, data base systems: 7th edition, Addison Wesley, PearsonEducation,
5. Chakrabarti, Advance database management systems , WileyDreamtech

| PC-AI-208A | Intelligent Systems | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To impart understanding of the main abstractions and reasoning for intelligent systems. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO 1** | Understand the basic terminologies in artificial intelligence to develop intelligent systems | | | | | | |
| **CO 2** | Apply the random search and heuristic search for intelligent systems. | | | | | | |
| **CO 3** | Understand the abstractions and reasoning for intelligent systems | | | | | | |
| **CO 4** | Apply the rule-based methods in intelligent systems | | | | | | |

**UNIT-I**

**Introduction:** Overview of AI Problems, AI problems as NP, NP-Complete, NP-Hard, Strong, and weak, neat and scruffy, symbolic and sub-symbolic, knowledge base and data driven AI.

**UNIT-II**

**Heuristic Search:** Best First Search, Hill Climbing, Beam Search, Tabu Search.

**Randomized Search:** Simulated Annealing, Genetic Algorithm, Ant Colony Optimization, Particle Swarm Optimization, Basics of probability theory and probability distributions, information theory, Bayesian learning, Gaussian Mixture models and the EM algorithm, Factor analysis, Principal components analysis, Independent Component Analysis.

**UNIT-III**

**IntelligentSystems:**Knowledgeacquisition,Computationalintelligence,Rule-basedsystems,Forwardchaining (a data-driven strategy), Conflict resolution, Backward chaining (a goal-driven strategy), Sources of uncertainty, Bayesian updating, Certainty theory.

**UNIT-IV**

**Possibility theory:** fuzzy sets and fuzzy logic, Object-oriented systems, Data abstraction, Inheritance, Encapsulation, Unified Modeling Language (UML), Dynamic (or late) binding.

**Key Application Areas:** Expert System, Decision Support Systems,

**Deep Learning:** Speech and vision, natural Language processing, Information Retrieval, Semantic Web.

**Suggested books:**

1. Artificial Intelligence" RB Mishra,PHI.
2. Introduction to Artificial Intelligence, Charnaik,Pearson.
3. Artificial Intelligence by Elaine Rich, Kevin Knight and Shivashankar B Nair, TataMcGraw Hill.
4. Introduction to Artificial Intelligence and Expert Systems by Dan W Patterson, PearsonEducation.
5. Artificial Intelligence: Building Intelligent Systems, KULKARNI, Parag , REPRINT, PHI.

| PC-AI-210A | Machine Learning | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To impart understanding of the main abstractions for machine learning. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | To understand the basic terminologies in machine learning and paradigms. | | | | | | |
| **CO 2** | To get an insight of when to apply a particular machine learning approach. | | | | | | |
| **CO 3** | To explore supervised and unsupervised learning paradigms of machine learning. | | | | | | |
| **CO 4** | Extract features that can be used for machine learning approach in various applications. | | | | | | |

**UNIT I**

**Introduction**:Machinelearning,Terminologiesinmachinelearning,Typesofmachinelearning,Discriminative Models: Least Square Regression, Gradient Descent Algorithm, Introduction to Regression and classification, Prediction Model, probabilistic interpretation, Regularization, multi class SMOalgorithm,

**UNIT II**

**Generative models**: Linear Discriminative Analysis, Naive Bayes classifier, Decision tree, Ensemble models – Bagging and Boosting.

**Supervised Learning (Regression/Classification) Basic methods**: Distance-based methods, Nearest-Neighbors, Decision Trees, Naive Bayes, Linear models: Linear Regression, Logistic Regression, Generalized Linear Models, Support Vector Machines, Nonlinearity and Kernel Methods

**UNIT III**

**(Unsupervised Learning) Clustering:** K-means/Kernel K-means, Dimensionality Reduction: PCA and kernel PCA, Introduction to ICA, Evaluating Machine Learning algorithms and Model Selection

**UNIT IV**

**An Introduction to some other advanced topics,** e.g., Semi-supervised Learning, Active Learning,Reinforcement Learning, Inference in Graphical Models, Bayesian Learning and Inference.

**Suggested books:**


1. Kevin Murphy, Machine Learning: A Probabilistic Perspective, MIT Press,2012
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning, Springer2009 (freely availableonline)
3. Christopher Bishop, Pattern Recognition and Machine Learning, Springer,2007.

| PC-AI- 212 LA | Operating Systems Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Theory** | **Practical** | **Credit** | **Practical** | **Minor Test** | **Total** | **Time** |
| **0** | **0** | **4** | **2** | **60** | **40** | **100** | **3 Hour** |
| **Purpose** | To familiarize the students with the basics of Operating Systems. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To understand the CPU scheduling. | | | | | | |
| **CO2** | To learn about memory management. | | | | | | |
| **CO3** | To understand system calls. | | | | | | |
| **CO4** | To understand the concept of file operations. | | | | | | |
| **CO5** | To learn various classical problems. | | | | | | |

1. Simulation of the CPU scheduling algorithms a) Round Robin b) SJF c) FCFS d)Priority
2. Program for paging techniques of memorymanagement.
3. Program for page replacementalgorithms
4. Simulation of Bankers Deadlock Avoidance and Preventionalgorithms.
5. Program for Implementation of SystemCalls.
6. Program for File Permissions
7. Program for File Operations.
8. Program for File Copy and Move.
9. Program for Dining PhilosophersProblem.
10. Program For Producer – Consumer Problemconcept.
11. Program for disk schedulingalgorithms.

**NOTE: A student has to perform at least ten experiments. Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.**

| PC-AI- 214 LA | Database Management Systems Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Theory** | **Practical** | **Credit** | **Practical** | **Minor Test** | **Total** | **Time** |
| **0** | **0** | **4** | **2** | **60** | **40** | **100** | **3 Hour** |
| **Purpose** | To implement practically the various concepts of DBMS | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To understand& Implement basic DDL commands. | | | | | | |
| **CO2** | To learn & Implement DML and DCL commands. | | | | | | |
| **CO3** | To understand the SQL queries using SQL operators. | | | | | | |
| **CO4** | To understand the concept of relational algebra and implement using examples. | | | | | | |

## LIST OF PRACTCALS

**1.** Create a database and write the programs to carry out the followingoperation:
- Add , Delete and modify a record in thedatabase
- Generatequeries
- Dataoperations
- List all the records of database in ascendingorder.

**2.** To perform various integrity constraints on relationaldatabase.

**3.** Create a database and perform the followingoperations:-
- Arithmetic and Relationaloperations
- Group by & havingclauses
- Like predicate for pattern matching indatabase

**4.** Create a view to display details of employees working on more than oneproject.

**5.** Create a view to display details of employees not working on anyproject.

**6.** Using two tables create a view which shall perform natural join, equi join, outerjoins.

**7.** Write a procedure to give incentive to employees working on all projects. If no suchemployee found give app.Message.

**8.** Write a procedure for computing amount telephone bill on the basic of followingconditions.
- If Telephone rent Rs. 205 including first 105 freeunits.
- if extra units>0 but <500 then rate is 80 paise perunit.
- if extra units>500 then rate is Rs. 1.20 perunit.

For this purpose create a table with name, Phone No., No. of units consumed, bill amount of a customer.

**9.** Write a procedure for computing income tax of employee on the basic of followingconditions
- if gross pay<=40,000 then I.T rate is 0%.
- if gross pay>40,000 but <60000 then I.T rate is10%.
- if gross pay>60,000 but <1,00,0000 then I.T rate is20%.
- if gross pay>1,00,0000 then I.T rate is 30%.

For this purpose create a table with name, ssn, gross salary and income tax of the employee.

**10.** Write trigger for before and after insertion, deletion and updatingprocess.

**NOTE: A student has to perform at least ten experiments. Seven experiments should be performed fromtheabovelist.Remainingthreeexperimentsmayeitherbeperformedfromtheabovelistordesigned & set by the concerned institution as per the scope of thesyllabus.**

| PC-AI- 216 LA | AI & ML Workshop - II | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Theory** | **Practical** | **Credit** | **Practical** | **Minor Test** | **Total** | **Time** |
| **0** | **0** | **4** | **2** | **60** | **40** | **100** | **3 Hour** |
| **Purpose** | To implement the basic concepts of Artificial Intelligence problems as well as basic concepts of Machine Learning. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To implement the search space problems. | | | | | | |
| **CO2** | To formulate and implement the game problems. | | | | | | |
| **CO3** | To implement the various classifiers on different dataset | | | | | | |
| **CO4** | To implement the clustering algorithms | | | | | | |

## LIST OF PRACTCALS

1. Write a program to implement BFS andDFS.
2. Write a program to implement A*algorithm.
3. Write a program to implement AO*algorithm.
4. Write a program to implement Hill ClimbingApproach.
5. Write a program to implement the Min MaxStrategy.
6. Write a program for defining Array usingnumpy.
7. Write a program for classification of an object by implementingscikit-library.
8. Case study of data visualization of timeseries.
9. Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a.CSV
10. For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm. Output a description of the set of all hypotheses consistent with the trainingexamples.

**NOTE: A student has to perform at least ten experiments. Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.**

| MC-901A | Environment Sciences | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **0** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To learn the multidisciplinary nature, scope and importance of Environmental sciences. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | The students will be able to learn the importance of natural resources. | | | | | | |
| **CO2** | To learn the theoretical and practical aspects of eco system. | | | | | | |
| **CO3** | Will be able to learn the basic concepts of conservation of biodiversity. | | | | | | |
| **CO4** | The students will be able to understand the basic concept of sustainable development. | | | | | | |

## UNIT 1

**The multidisciplinary nature of environmental studies,** Definition, Scope and Importance, Need for public awareness, Natural Resources: Renewable and Non-Renewable Resources: Natural resources and associated problems.

a. ForestResources:Useandover-exploitation,deforestation,casestudies.Timbereztraction,mining,dams and their effects on forests and tribalpeople.
b. Water Resources: Use and over-utilization of surface and ground water, floods, drought, conflictsover water, dams-benefits andproblems.
c. MineralResources:Useandexploitation,environmentaleffectsofextractingandusingmineralresources, casestudies.
d. FoodResources:WorldFoodProblems,changescausedbyagricultureandovergrazing,effectsofmodern agriculture, fertilizer-pesticide problems, water logging, salinity, casestudies.
e. EnergyResources:Growingenergyneeds,renewableandnon-renewableenergysources,useofalternate energy sources. Casestudies.
f. Land Resources: Land as a resource, land, degradation, man induced landslides, soil erosionand desertification.

Role of an individual in conservation of natural resources, Equitable use of resources for sustainable lifestyle.

## UNIT II

**Ecosystem-Concept of an ecosystem**. Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological Succession, Food Chains, food webs and ecological pyramids.Introduction,types,characteristicfeatures,structure,andfunctionofthefollowingecosystem:(a)Forest Ecosystem, (b) Grassland Ecosystem, (c) Desert Ecosystem and (d) Aquatic Ecosystems (ponds, streams, lakes, rivers, oceans, estuaries

Field Work : Visit to a local area to document environment assets _ river/forest/grassland/hill/mountain, Visit to a local polluted site – Urban/Rural Industrial/Agricultural, Study of common plants, insects and birds, Study of simple ecosystems-pond, river, hill, slopes etc. (Field work equal to 5 lecture hours).

## UNIT III

**Biodiversity and its conservation:** Introduction, Definition: genetic, species and ecosystem diversity. Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aestheticandoptionvalues.Biodiversity ofglobal,National,andlocallevels.Indiaasamega-diversitynationHot spots of Biodiversity, Threats to biodiversity: Habitat loss, poaching of wild life, man-wildlife conflicts, Endangered and endemic species of India, Conservation of Biodiversity- In situ and Ex-Situ conservation ofbiodiversity.

**Environmental Pollution Definition:** Cause, effects and control measures of (a) Air Pollution (b) Water Pollution (c) Soil Pollution (d) Marine Pollution (e) Noise Pollution (f) Thermal Pollution (g) Nuclear Hazards Solidwastemanagement-cause,effectsandcontrolmeasuresofurbanandindustrialwastes,Roleofanindividual in prevention of pollution, Pollution case studies, Disaster management: floods, earthquake, cyclone and landslides

## UNIT IV

**Social Issues and the Environment**. From unsustainable to sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people: Its problems and concerns, Case Studies: Environmental ethics-issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies: Wasteland Reclamation, Consumerism and waste products, Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public Awareness, Human population and the Environment, Population growth, variation among nations, Population Explosion-Family Welfare Programme, Environment and human health. Human rights, Value Education, HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and Human Health, Case Studies, Drugs and their effects; Useful and harmful drugs, Use and abuse of drugs, Stimulant and depressan drugs, Concept of drug de-addiction, Legal position on drugs and laws related to drugs.

**Suggested Books**


1. Environmental Studies- Deswal and Deswal. Dhanpat Rai and Co.
2. Environmental Science and Engineering Anandan, P. and Kumaravelan, R. 2009. ScitechPublications (India) Pvt. Ltd.,India
3. Environmental Studies. Daniels Ranjit R. J. and Krishnaswamy. 2013. WileyIndia.
4. Environmental Science- Botkin and Keller. 2012. Wiley ,India

| Bachelor of Technology (Artificial Intelligence & Data Science) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Modified Credit Based Scheme of Studies/Examination | | | | | | | | | | |
| Semester V (w.e.f Session 2023-2024) | | | | | | | | | | |
| S.No. | Course Code | Subject | L:T:P | Hours/Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | AI-DS-301A | Big Data Analytics | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | AI-DS-303A | Machine Learning | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | AI-DS-305A | Artificial Neural Networks | 4:0:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 4 | AI-DS-307A | Digital Image Processing | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5 | PEC | Elective-I | 4:0:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 6 | AI-DS-309LA | Project –I | 0:0:4 | 4 | 2 | -- | 100 | 100 | 200 | 3 |
| 7 | AI-DS-311LA | Digital Image Processing Lab | 0:0:3 | 3 | 1.5 | -- | 40 | 60 | 100 | 3 |
| 8 | AI-DS-313LA | Machine Learning Lab | 0:0:3 | 3 | 1.5 | -- | 40 | 60 | 100 | 3 |
| | | **Total** | | **27** | **22** | **375** | **305** | **220** | **900** | |
| 9 | SIM-301A* | Seminar on Summer Internship | 2:0:0 | 2 | 0 | 0 | 50 | 0 | 50 | |
| 10 | MC-904A | Energy Resources & Management | 3:0:0 | 3 | 0 | 0 | 100 | 0 | 100 | 3 |

**SIM-301*A is a mandatory credit-less course in which the students will be evaluated for the Summer Internship undergone after 4th semester and students will be required to get passing marks to qualify.**

| **PEC Elective-I** |
|---|
| Fuzzy Logic and Applications PE-AI-DS-T301A |
| Genetic Algorithm PE-AI-DS-T303A |
| Application of Data Science in Industry PE-AI-DS-T305A |

| AI-DS-301A | Big Data Analytics | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | **To familiarize the students with the Big Data Analytics** | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Understand the Big Data Platform and its Use cases. | | | | | | |
| **CO 2** | Understand Apache Hadoop, Provide hands on Hodoop Eco System. | | | | | | |
| **CO 3** | Understand Map Reduce Jobs, Apply analytics on Structured, Unstructured Data. | | | | | | |
| **CO 4** | Exposure to Data Analytics with R. | | | | | | |

**UNIT-I**

**INTRODUCTION TO BIG DATA AND HADOOP:** Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, Analysing Data with Hadoop, Hadoop Streaming, Hadoop Echo System, IBM Big Data Strategy, Introduction to Infosphere BigInsights and Big Sheets

**UNIT-II**

**HDFS(Hadoop Distributed File System):** The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Data Ingest with Flume and Scoop and Hadoop archives, Hadoop I/O: Compression, Serialization, Avro and File-Based Data structures.

**Map Reduce:** Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features

**UNIT- III**

**Hadoop Eco System:** Pig : Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases,Grunt, Pig Latin, User Defined Functions, Data Processing operators.

Hive : Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL Tables, Querying Data and User Defined Functions.

Hbase : HBasics, Concepts, Clients, Example, Hbase Versus RDBMS. Big SQL : Introduction

**UNIT-IV**

**Data Analytics with R** Machine Learning : Introduction, Supervised Learning, Unsupervised Learning, Collaborative Filtering. Big Data Analytics with BigR.

**Suggested Books:**


1. Text Books • Tom White " Hadoop: The Definitive Guide" Third Edit on, O'reily Media, 2012.
2. Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley 2015.


**References Books:**


1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
2. Jay Liebowitz, "Big Data and Business Analytics" Auerbach Publications, CRC press (2013)

| AI-DS-303A | Machine Learning | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | **To familiarize the students with the Machine learning** | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Extract features that can be used for a particular machine learning approach in various IOT applications. | | | | | | |
| **CO 2** | Compare and contrast pros and cons of various machine learning techniques and to get an insight of when to apply a particular machine learning approach. | | | | | | |
| **CO 3** | To mathematically analyse various machine learning approaches and paradigms. | | | | | | |
| **CO 4** | Modeling and estimation of machine learning | | | | | | |

## UNIT-I

Supervised Learning: Distance-based methods, Nearest-Neighbours, Decision Trees, Naive Bayes, Linear Regression, Logistic Regression, Generalized Linear Models Support Vector Machines, Nonlinearity and Kernel Methods, Beyond Binary Classification: Multi-class/Structured Outputs, Ranking.

## UNIT-II

Unsupervised Learning: Clustering: K-means/Kernel K-means Dimensionality Reduction: PCA and kernel PCA, Matrix Factorization and Matrix Completion, Generative Models (mixture models and latent factor models)

## UNIT- III

Evaluating Machine Learning algorithms and Model Selection, Introduction to Statistical Learning Theory, Ensemble Methods (Boosting, Bagging, Random Forests), Introduction to scalable machine learning, Recent trends in various learning techniques of machine learning.

## UNIT-IV

Sparse Modeling and Estimation, Modeling Sequence/Time-Series Data, Deep Learning and Feature Representation Learning

**Suggested Books:**

1. Kevin Murphy, Machine Learning: A Probabilistic Perspective, MIT Press,

**References Books:**

1. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning, Springer 2009 (freely available online)
2. Christopher Bishop, Pattern Recognition and Machine Learning, Springer, 2007.

| AI-DS-305A | Artificial Neural Networks | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **4** | **-** | **-** | **4** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | **To familiarize the students with the Artificial Neural Networks** | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | To learn the basics of artificial neural networks concepts. | | | | | | |
| **CO 2** | Expose detailed explanation of various neural networks architecture. | | | | | | |
| **CO 3** | To explore knowledge of special types of Artificial neural networks. | | | | | | |
| **CO 4** | To explore deep neural networks and fuzzy logic techniques. | | | | | | |

**UNIT-I**

**Fundamentals of Artificial Neural Networks** Introduction: Concepts of neural networks, Characteristics of Neural Networks, Applications of Neural Networks. Fundamentals of Neural Networks: The biological prototype, Neuron concept, Single layer Neural Networks, Multi-Layer Neural Networks, terminology, Notation and representation of Neural Networks, Training of Artificial Neural Networks. Representation of perceptron, perceptron learning and training, Classification, linear Separability

**UNIT-II**

**Neural Networks** Hopfield nets: Structure, training, and applications, Back Propagation: Concept, Applications and Back Propagation Training Algorithms. Counter Propagation Networks: Kohonan Network, Grossberg Layer & Training, applications of counter propagation, Image classification. Bi-directional Associative Memories: Structure, retrieving a stored association, encoding associations.

**UNIT- III**

**Special Neural Networks** ART: ART architecture, ART classification operation, ART implementation and characteristics of ART. Image Compression Using ART, Optical Neural Networks: Vector Matrix Multipliers, Hop field net using Electro optical matrix multipliers, Holographic correlator, Optical Hopfield net using Volume Holograms, Cognitrons and Neocognitrons: structure and training.

**UNIT-IV**

**Deep Learning Neural Networks** Deep Networks: CNN, RNN, LSTM, Attention layers, Applications, Techniques to improve deep networks: DNN Optimization, Regularization, AutoML.

**Suggested Books:**


1. Li Min Fu, "Neural Networks in Computer Intelligence", McGraw-Hill, Inc. 2012.
2. S N Sivanandam, "Neural Networks using MATLAB 6.0", TMH, 4th. Reprint 2015.
3. Freeman J.A. & D.M. Skapura, "Neural Networks: Algorithms, Applications and Programming Techniques", Addison Wesley, Reading, Mass, 2014.


**References Books:**


1. Deep Learning (Ian J. Goodfellow, YoshuaBengio and Aaron Courville), MIT Press, 2016.
2. Deep Learning with Python: A Hands-On Introduction by Ketkar, Apress
3. François Chollet, Fundamentals of Deep Learning: Designing next-generation machine intelligence algorithms, Manning Publications, 2017

| AI-DS-307A | Digital Image Processing | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | **To familiarize the students with the Digital Image Processing** | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms. | | | | | | |
| **CO 2** | Operate on images using the techniques of smoothing, sharpening and enhancement. | | | | | | |
| **CO 3** | To explore knowledge of image segmentation | | | | | | |
| **CO 4** | To explore image compression and recognition | | | | | | |

**UNIT-I**

**Digital Image Fundamentals Networks** Steps in Digital Image Processing – Components – Elements of Visual Perception – Image Sensing and Acquisition – Image Sampling and Quantization – Relationships between pixels - Color image fundamentals - RGB, HSI models, Two-dimensional mathematical preliminaries, 2D transforms - DFT, DCT.

**UNIT-II**

**Image Enhancement** Spatial Domain: Gray level transformations – Histogram processing – Basics of Spatial Filtering– Smoothing and Sharpening Spatial Filtering, Frequency Domain: Introduction to Fourier Transform– Smoothing and Sharpening frequency domain filters – Ideal, Butterworth and Gaussian filters, Homomorphic filtering, Color image enhancement.

**UNIT- III**

**Image Restoration** Image Restoration - degradation model, Properties, Noise models – Mean Filters – Order Statistics – Adaptive filters – Band reject Filters – Band pass Filters – Notch Filters – Optimum Notch Filtering – Inverse Filtering – Wiener filtering

**UNIT-IV**

**Image Segmentation** Edge detection, Edge linking via Hough transform – Thresholding - Region based segmentation – Region growing – Region splitting and merging – Morphological processing-erosion and dilation, Segmentation by morphological watersheds – basic concepts – Dam construction – Watershed segmentation algorithm. **Image Compression and Recognition** Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic coding, JPEG standard, MPEG. Boundary representation, Boundary description, Fourier Descriptor, Regional Descriptors – Topological feature, Texture - Patterns and Pattern classes - Recognition based on matching.

**Suggested Books:**

1. Rafael C. Gonzalez, Richard E. Woods, _Digital Image Processing‘, Pearson, Third Edition, 2010.
2. Anil K. Jain, _Fundamentals of Digital Image Processing‘, Pearson, 2002.

**References Books:**

1. Kenneth R. Castleman, _Digital Image Processing‘, Pearson, 2006.
2. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins, _Digital Image Processing using MATLAB‘, Pearson Education, Inc., 2011.

| AI-DS-311LA | Digital Image Processing Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Practical** | **Minor Test** | **Total** | **Time** |
| **-** | **-** | **3** | **1.5** | **60** | **40** | **100** | **3 hrs** |
| **Purpose** | **To Introduce students with Digital Image Processing** | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | **To formulate the processing of images with simple problems.** | | | | | | |
| **CO 2** | **Implementation of Non-Linear filtering Techniques.** | | | | | | |
| **CO 3** | **Implementation of High frequency components of an images.** | | | | | | |
| **CO 4** | **Implementation of Various Segmentation of an images.** | | | | | | |

**LIST OF PROGRAMS**

1. To create a program to display grayscale image using read and write operation.
2. To create a vision program to find histogram value and display histograph of a grayscale and color image.
3. To create a vision program for Non-Linear Filtering technique using edge detection
4. create a vision program to determine the edge detection of an image using different operators.
5. To create a program to discretize an image using Fourier transformation.
6. To create a program to eliminate the high frequency components of an image.
7. To create a color image and perform read and write operation**.**
8. To obtain the R, B, G colour values and resolved colour values from a colour box by choosing any colour.
9. To create a program performs discrete wavelet transform on image.
10. To create a program for segmentation of an image using watershed transforms.

| AI-DS-313LA | Machine Learning Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| L | T | P | Credit | Practical | Minor Test | Total | Time |
| - | - | 3 | 1.5 | 60 | 40 | 100 | 3 hrs |
| Purpose | To Introduce students with Machine Learning | | | | | | |
| Course Outcomes(CO) | | | | | | | |
| CO 1 | To formulate the processing on data samples. | | | | | | |
| CO 2 | Implementation of Back Propagation algorithm. | | | | | | |
| CO 3 | Implementation of K-mean cluster. | | | | | | |
| CO 4 | Implementation of Weighted Regression Algorithm. | | | | | | |

**LIST OF PROGRAMS**

1. Implement and demonstratethe FIND-Salgorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.

2. For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithmto output a description of the set of all hypotheses consistent with the training examples.

3. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge toclassify a new sample.

4. Build an Artificial Neural Network by implementing the Backpropagation algorithm and test the same using appropriate data sets.

5. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.

6. Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set.

7. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.

8. Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using k-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering. You can add Java/Python ML library classes/API in the program.

9. Write a program to implement k-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.

10. Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.

| MC-904A | Energy Resources & Management | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **0** | - | **100** | **100** | **3** |
| **Purpose** | To make the students conversant with the basics concepts and conversion of various form of Energy | | | | | | |
| **COURSE OUTCOMES** | | | | | | | |
| **CO1** | An overview about Energy Resources, Conventional and Non-conventional sources | | | | | | |
| **CO2** | Understand the Layout and working of Conventional Power Plants | | | | | | |
| **CO3** | Understand the Layout and working of Non-Conventional Power Plants | | | | | | |
| **CO4** | To understand the Energy Management, Audit and tariffs, Role of Energy in Economic development and Energy Scenario in India | | | | | | |

**UNIT-I**

**Introduction**: Types of energy, Conversion of various forms of energy, Conventional and Non-conventional sources, Need for Non-Conventional Energy based power generation.

**UNIT-II**

**Conventional Energy sources:** Types of Conventional Energy sources, Selection of site**,** working of Thermal, Hydro, Nuclear and Diesel power plants and their schematic diagrams & their comparative advantages/ disadvantages.

**UNIT-III**

**Non-Conventional Energy sources:** Types ofNon-Conventional Energy sources , Basic principle, site selection of Solar energy power plant, photovoltaic technologies, PV Systems and their components, Wind energy power plant , Bio energy plants ,Geothermal energy plants and Tidal energy plants.

**UNIT-IV**

**Energy Management:** General Principles of Energy Management, Energy Management Strategy, Modern trends and developments towards Computerizations of Power System.

**Energy Audit:** Need, Types, Methodology and Approach.

**Energy Scenario**: Lay out of power system, Role of Energy in Economic development, energy demand, availability and consumption, Indian energy scenario, long term energy scenario, energy sector reforms in India, energy strategy for the future.

**References:**


- Energy Studies-Wiley Dream Tech India.
- Non-conventional energy resources- Shobhnath Singh, Pearson.
- Electrical Power Systems : Soni, Gupta, Bhatnagar – Dhanpat Rai & Sons
- NEDCAP: Non Conventional Energy Guide Lines
- Non conventional energy sources : G.D. Roy
- Non Conventional energy resources :B H Khan - McGraw Hill
- Applied Solar Energy : Meinel A B - Addison Wesley Publications
- Direct Energy ConversionGeorge: Sutton -McGraw

| PE-AI-DS-T301A | Fuzzy Logic and Applications | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **4** | **-** | **-** | **4** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | To make the students understand the concept of fuzzy logic and application. | | | | | | |
| **COURSE OUTCOMES** | | | | | | | |
| **CO1** | An overview about Fuzzy Sets. | | | | | | |
| **CO2** | Understand the working of extension and graphs. | | | | | | |
| **CO3** | Understand Fuzzy relation and fuzzy graph. | | | | | | |
| **CO4** | To understand application of fuzzy set theory and control. | | | | | | |

**UNIT-I**

**Introduction to Fuzzy Sets**: Crispness , Vagueness, Fuzziness, Uncertainty, Fuzzy Set Theory **Fuzzy Mathematics: Fuzzy Sets-Basic Definitions**- Basic Definitions, Basic Set-Theoretic Operations for Fuzzy Sets, **Fuzzy Measures and Measures of Fuzziness:** Fuzzy Measures, Measures of Fuzziness.

**UNIT-II**

**Extensions:** Types of Fuzzy Sets, Further Operations on Fuzzy Sets, Algebraic Operations, Set-Theoretic Operations, Criteria for Selecting Appropriate Aggregation Operators **The Extension Principle and Applications:** The Extension Principle, Operations for Type 2 Fuzzy Sets, Algebraic Operations with Fuzzy Numbers, Special Extended Operations, Extended Operations for LR-Representation of Fuzzy Sets.

**UNIT-III**

**Fuzzy Relations and Fuzzy Graphs:** Fuzzy Relations on Sets and Fuzzy Sets, Compositions of Fuzzy Relations, Properties of the Min-Max Composition, Fuzzy Graphs, Special Fuzzy Relations **Uncertainty Modeling:** Application-oriented Modeling of Uncertainty, Causes of Uncertainty, Uncertainty Methods, Possibility Theory, Fuzzy Sets and Possibility Distributions, Probability of Fuzzy Events, Probability of a Fuzzy Event as a Scalar, Probability of a Fuzzy Event as a Fuzzy Set, Possibility vs. Probability.

**UNIT-IV**

**Applications of Fuzzy Set Theory:** Fuzzy Logic, Fuzzy Languages **Fuzzy Sets and Expert Systems:** Introduction to Expert Systems, Uncertainty Modeling in Expert Systems, Applications **Fuzzy Control:** Origin and Objective, The Fuzzy Controller, Types of Fuzzy Controllers, Design Parameters, Adaptive Fuzzy Control, Applications, Tools, Stability, Extensions.

**References:**


1. H.-J. Zimmermann, Fourth Edition, 'Fuzzy Set Theoryand Its Applications'
2. Lotfi A Zadeh, Rafik Aziz Aliev, Fuzzy Logic Theory And Applications: Part I And Part Ii
3. Guanrong Chen, Trung Tat Pham, Fuzzy Sets, Fuzzy Logic, and Fuzzy Control Systems

| PE-AI-DS-T303A | Genetic Algorithm | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **4** | **-** | **-** | **4** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | To make the students understand the concept of Genetic Algorithm. | | | | | | |
| **COURSE OUTCOMES** | | | | | | | |
| **CO1** | An overview about Genetic Algorithm. | | | | | | |
| **CO2** | Understand the working of Genetic Algorithm in models. | | | | | | |
| **CO3** | Understand Theoretical foundation. | | | | | | |
| **CO4** | To understand application of fuzzy set theory and control. | | | | | | |

**UNIT-I**

**Genetic Algorithms:** Overview, Brief History, Biological Terminology, Search Spaces And Fitness Landscapes, Elements Of Genetic Algorithms, Examples Of Fitness Functions, Ga Operators, A Simple Genetic Algorithm, Genetic Algorithms And Traditional Search Methods, Two Brief Examples, How Do Genetic Algorithms Work?

**UNIT-II**

**Genetic Algorithms In Problem Solving:** Evolving Computer Programs, Data Analysis And Prediction, Evolving Neural Networks **Genetic Algorithms In Scientific Models:** Modeling Interactions Between Learning And Evolution, Modeling Sexual Selection, Modeling Ecosystems, Measuring Evolutionary Activity

**UNIT-III**

**Theoretical Foundations Of Genetic Algorithms:** Schemas And The Two−Armed Bandit Problem, Royal Roads- Royal Road Functions, Experimental Results, Steepest−Ascent Hill Climbing (Sahc), Next−Ascent Hill Climbing (Nahc), Random−Mutation Hill Climbing (Rmhc), Analysis Of Random−Mutation Hill Climbing, Hitchhiking In The Genetic Algorithm, An Idealized Genetic Algorithm, Exact Mathematical Models Of Simple Genetic Algorithms, Statistical−Mechanics Approaches.

**UNIT-IV**

When Should A Genetic Algorithm Be Used?, Encoding A Problem For A Genetic Algorithm, Adapting The Encoding, Selection Methods, Genetic Operators, Parameters For Genetic Algorithms.

**References:**


1. Mitchell Melanie, 'An Introduction to Genetic Algorithms'
2. David Edward Goldberg, 'Genetic Algorithms in Search, Optimization, and Machine Learning'.

| PE-AI-DS-T305A | Application of Data Science in Industry | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **4** | **-** | **-** | **4** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | To make the students understand the concept of Application Of Data Science in Industry. | | | | | | |
| **COURSE OUTCOMES** | | | | | | | |
| **CO1** | Provide with the knowledge and expertise to become a proficient data scientist. | | | | | | |
| **CO2** | Explain how data is collected, managed and stored for data science. | | | | | | |
| **CO3** | Critically evaluate data visualizations based on their design and use for communicating stories from data. | | | | | | |
| **CO4** | To understand application of Data Science and Big Data. | | | | | | |

**UNIT-I**

Introduction to core concepts and technologies: Introduction, Terminology, data science process, data science toolkit, Types of data, Example applications. Data collection and management: Introduction, Sources of data, Data collection and APIs, Exploring and fixing data, Data storage and management, Using multiple data sources.

**UNIT-II**

**Data analysis:** Introduction, Terminology and concepts, Introduction to statistics, Central tendencies and distributions, Variance, Distribution properties and arithmetic, Samples/CLT, Basic machine learning algorithms, Linear regression, SVM, Naive Bayes.

**UNIT-III**

**Data visualization**: Introduction, Types of data visualization, Data for visualization: Data types, Data encodings, Retinal variables, Mapping variables to encodings, Visual encodings.

**UNIT-IV**

**Big Data:** Understand Big Data Challenges, Various application in Data Science, What exactly is Data Science and what do Data Scientists do, Data Science contrasted with other disciplines, Case Study & Use Cases. Real world applications- Applications of Machine Learning

**References:**


1. Cathy O'Neil and Rachel Schutt. Doing Data Science, Straight Talk From The Frontline. O'Reilly.
2. Jure Leskovek, Anand Rajaraman and Jeffrey Ullman. Mining of Massive Datasets. v2.1, Cambridge University Press.

| Bachelor of Technology (Artificial Intelligence & Data Science) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Modified Credit Based Scheme of Studies/Examination** | | | | | | | | | | |
| **Semester VI (w.e.f Session 2023-2024)** | | | | | | | | | | |
| **S.No.** | **Course Code** | **Subject** | **L:T:P** | **Hours/Week** | **Credits** | **Examination Schedule (Marks)** | | | | **Duration of exam (Hrs)** |
| | | | | | | **Major Test** | **Minor Test** | **Practical** | **Total** | |
| 1 | AI-DS-302A | Deep and Advanced Machine Learning | 4:0:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 2 | AI-DS-304A | Bio Informatics | 4:0:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 3 | PE | Elective – II | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PE | Elective – III | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5 | OE | Open Elective-I | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | PE-AI-DS-LA | Elective - III Lab | 0:0:3 | 3 | 1.5 | -- | 40 | 60 | 100 | 3 |
| 7 | AI-DS-306LA | Deep and Advanced Machine Learning Lab | 0:0:3 | 3 | 1.5 | -- | 40 | 60 | 100 | 3 |
| 8 | AI-DS-308LA | Unix Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| | | **Total** | **25** | **25** | **21** | **375** | **245** | **180** | **800** | |

**The course of both PE & OE will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**

| **PE-II** | **PE -III** |
|---|---|
| Cloud Web Services PE-AI-DS-T310A | High Performance Computing PE-AI-DS-316A |
| Data Analytics using SQL PE-AI-DS-T312A | Human AI Interaction PE-AI-DS-318A |
| Social Media Analytics PE-AI-DS-T314A | Natural Language Processing PE-AI-DS-320A |
| **OE-I** | |
| Inferential Statistics OE-AI-DS-302A | |
| Management Information System OE-AI-DS-304A | |
| Enterprise Resource Planning OE-AI-DS-306A | |

| AI-DS-302A | Deep and Advanced Machine Learning | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **4** | **-** | **-** | **4** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | **To familiarize the students with the Deep and Advanced Machine Learning** | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Different types of machine learning and its utility | | | | | | |
| **CO 2** | Application of Hidden Markov Model and Artificial neural networks to different types of bioinformatics data | | | | | | |
| **CO 3** | Determination of Bayesian Network (BN) from expression data. | | | | | | |
| **CO 4** | Application of stochastic context-free grammar (SCFG) to predict RNA secondary structure. | | | | | | |

**UNIT-I**

**Advanced Machine learning with Tensor Flow:** Introduction, Tensor flow operations, declaring tensors, working with metrics, declaring operations, implementing activation functions, operations in computational graph, layering nested operations, working with multiple layers, implementing loss functions, implementing back propagation, working with batch and stochastic training, evaluating models, Implementing unit tests, multiple executors, productionalizing tensor flow

**UNIT-II**

**Reinforcement Learning:** Introduction, formal framework, different components to learn a policy, value based methods for RL, Q-learning, fitted Q-learning, Deep Q-networks, double DQN, dueling network architecture, distributional DQN, Multi step learning, concepts of generalization, feature selection, modifying objective function, hierarchical learning, bias-over fitting tradeoff

**UNIT- III**

**Model Evaluation and Hyper-parameter Tuning :** Streamlining workflows with pipelines, K-fold cross validation, Model performance measures, debugging algorithms with learning and validation curves, fine-tuning machine learning models via grid search, looking at different performance evaluation metrics, Ranking metrics, Classification metrics, regression metrics, Bootstrapping and Jackknife, Hold-out validation, difference between model validation and testing.

**UNIT-IV**

**Machine Learning Deployment:** Serializing fitted scikit – learn estimators, setting up a SQLite database for data storage,developing web application with Flask, turning the classifier into a web application, turning a regression problem into a web application, pickle model, deploying web application to a public server, Cloud deployment using AWS and Google.

**Suggested Books:**


1. Master Machine Learning Algorithms, Jason Brownlee
2. Deeper Insights into Machine Learning, Birmingham, Packt
3. An Introduction to Deep Reinforcement Learning, Vincent François-Lavet, Peter
4. Henderson,Riashat Islam, Marc G. Bellemare and Joelle Pineau
5. Tensorflow machine learning cookbook, Nick McClure, Packt

| AI-DS-304A | Bio Informatics | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **4** | **-** | **-** | **4** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | **To provide students the fundamental concepts and methods of Bio Informatics** | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Students will know Different types of Bio Informatics and its utility | | | | | | |
| **CO 2** | Applications of Bio Informatics where it solves different Problems. | | | | | | |
| **CO 3** | Studied Different Structures of DNA and RNA. | | | | | | |
| **CO 4** | Translation, Nucleic acids-Information Storage and Proteins-Information Expression. | | | | | | |

**UNIT-I**

Introduction to Bio Informatics: Overview of Informatics and Biology, Areas of Biology where BioInformatics helped, How Computers helped in Biology, How Bio Informatics solves different Problems, Protein Sequencing.

**UNIT-II**

Molecular Biology Data: Introduction , PubMed, Molecular Biology DataBases, Protein Structure Data, DNA,RNA and Protein Sequence data, Genetic Data, Biochemical Pathway Data, Gene Expression Data.

**UNIT- III**

Nucleic Acids: Basic chemistry of Nucleic acid, Structure of DNA, Base Pairing, RNA Structure, Replication of DNA, Transcription, Translation, Nucleic acids-Information Storage and Proteins-Information Expression

**UNIT-IV**

Protein Structure, Folding and Function: The Chemistry of Proteins, Secondary Structures of Proteins, Protein Function, Protein Structure, Protein Folding, Nucleic acid Protein Interaction

**Suggested Books:**


1. Archana Verma, Ebook of Introduction to Bio Informatics, Publisher : Laxmi Publications Pvt Ltd; First edition (12 January 2018)
2. P Baldiand S Brunak, BIOINFORMATICS: The Machine Learning Approach


**Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.**

| PE-AI-DS-T310A | Cloud Web Services | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | **To provide students a sound foundation of the Cloud Computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.** | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Apply and design suitable Virtualization concept, Cloud Resource Management and design scheduling algorithms | | | | | | |
| **CO 2** | Analyze the Cloud computing setup with its vulnerabilities and applications using different architectures. | | | | | | |
| **CO 3** | Design different workflows according to requirements and apply map reduce programming model. | | | | | | |
| **CO 4** | Create combinatorial auctions for cloud resources and design scheduling algorithms for computing clouds | | | | | | |

## UNIT-I

**Introduction to Cloud Computing and Amazon Web Services** Introduction to Cloud Computing, Cloud Service Delivery Models (IAAS, PAAS, SAAS), Cloud Deployment Models (Private, Public, Hybrid And Community), Cloud Computing Security,Case Study.

Introduction to Amazon Web Services, Why Amazon? Use Cases, AWS Storage Options, AWS Compute Options, AWS Database Options, AWS Workflow Automation And Orchestration Options, AWS Systems Management And Monitoring Options, AWS Virtual Private Cloud Introduction, Pricing Concepts

## UNIT-II

**Introduction to EC2:** Introduction To EC2, Instance Types And Uses, Autoscaling Instances, Amazon Machine Images (AMIS), Modifying Existing Images, Creating New Images Off Of Running Instances, Converting An Instance Store AMI To An EBS AMI, Instances Backed By Storage Types, Creating A Web Server Using Ec2, Elastics Block Storage (EBS), Elastic IPS, Route 53 DNS System, Cloudfront SNS Pricing

## UNIT- III

**S3, Cloudwatch, Elastic Beanstalk And Security:** Introduction To S3, Buckets And Objects, Security, Creating A Web Server Using S3 Endpoints, Introduction To Cloudwatch, Creating Alarm Notifications, Autoscaling Instances, Deploying Scalable Application On AWS, Selecting And Launching An Application Environment, Provisioning Application Resources with Cloud formation.

Describe Amazon Dynamo, Understand key aspects of Amazon RDS, Launch an Amazon RDS instance, Identify what is Cloud Formation, Describe Amazon Cloud Watch metrics and alarms, Describe Amazon Identity and Access Management (IAM), Security In AWS, IAM (Identity And Access Management), Access Control Lists (ACLs), Securing Data at Rest And In Motion, Security Groups

## UNIT-IV

**AWS Storage, Elasticity and AWS Networking:** Amazon Storage, S3 Storage Basics, Managing Voluminous Information with EBS, Glacier Storage Service, AWS Networking: Networking Basics, VLAN Basics, Basics of AWS VLANs, AWS Network IP Addressing and Mapping

**Suggested Books:**


1. A Hands-On Guide to the Fundamentals of AWS Cloud 1st Edition, Kindle Edition
2 .Hand Book of Natural Language Processing, Second Edition – NITIN INDURKHYA FREDJ. DAMERAU, CRC Press
3. Mining Text Data - Charu C. Aggarwal, ChengXiangZhai, Springer
4.Text Mining Classification, Clustering, and Applications - Ashok N. Srivastava, Mehran Sahami, CRC Press


**Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.**

| AI-DS-306LA | Deep and Advanced Machine Learning Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Practical** | **Minor Test** | **Total** | **Time** |
| **-** | **-** | **3** | **1.5** | **60** | **40** | **100** | **3 hrs** |
| **Purpose** | **To familiarize the students with the advanced deep and machine learning** | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Different types of machine learning and its utility | | | | | | |
| **CO 2** | Application of Hidden Markov Model and Artificial neural networks to different types of bioinformatics data | | | | | | |
| **CO 3** | Determination of Bayesian Network (BN) from expression data. | | | | | | |
| **CO 4** | Application of stochastic context-free grammar (SCFG) to predict RNA secondary structure. | | | | | | |

**List of Experiments**

1. Build a machine learning model for house price prediction analysis using lasso and ridge regression
2. Build a machine learning model on hand written digits and compare the models using evaluation techniques.
3. Compare the differences between the accuracies obtained using ridge and lasso regression in first experiment
4. For the above build regression model, perform model evaluation, feature selection and parameter tuning
5. Build a classification model on heart disease UCI dataset using ensemble techniques
6. Compare the ensemble models built on heart disease data set and validate the same
7. Build a simple reinforcement learning model and use Montel Carlo learning to find the optimal combination of products using meal data with 4 ingredients and 9 products.
8. Build a Tic –Tac – Toe agent using Q-learning concept
9. Financial Time Series Monte Carlo Simulation on S&P 500 stock data.
10. Deploy a regression model of first experiment using Flask and build a web api on the same
11. Deploy the classification model of third experiment using amazon sage maker or as a pickle model as web api
12. Deploy the classification model of third experiment using Google cloud or as a pickle model as web api

| PE-AI-DS-T312A | Data Analytical using SQL | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | Understand the importance of Data Analytical using SQL | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Explain SQL benefits and its syntax | | | | | | |
| **CO 2** | Apply SQL statements to create, update, delete database objects | | | | | | |
| **CO 3** | Apply SQL queries to retrieve data from tables | | | | | | |
| **CO 4** | Test built-in functions to retrieve data and format | | | | | | |

**Unit-1**

**Introduction to SQL:** Introduction to Structure Query Language (SQL), SQL History & Evolution, Features of SQL, Understanding of SQL process, Benefits and Role of SQL along with different market forces, Types of SQL, SQL Standards, SQL and Networking, Centralized architecture, File Server Architecture, Client Server Architecture, Multitier Architecture, Understanding concept for OLAP and OLTP Applications, Difference between OLAP and OLTP, SQL and Database Management, Data warehouse Concept

**Unit-2**

**SQL Statements & Executions:** Types of SQL Statement, Data Definition language, Data Control language, Data Manipulation Language, Types of execution, Direct Invocation, Embedded SQL, Module Binding, Call-level interface, Data types, Constants, Numeric Constants, String Constants, Time & date Constants, Symbolic Constants, Expressions, Built in function

**Unit-3**

**Starting with basic SQL Syntax:** Types of Tables, Create Database statement, Drop, Use statement, Create table Statement, Drop table Statement, Create index Statement, Drop index Statement, Describe Statement, Truncate Statement, Alter table Statement, Insert INTO Statement, Update, Delete table Statement, Commit Statement, Create SQL Tables, Specify Column data types, Create user Defined Types, Specify Column Default Values, Alter SQL Tables, Updating Data, Using WHERE Clause, Using Logical operations, AND operations, OR operations, Deleting SQL table

**Unit-4**

**Extracting Information & Manipulating Data:** Select Statement, Returning only Distinct Rows, Using Aliases, Filtering Results using WHERE Clause, Logical Operations and Operator Precedence, NOT operator, BETWEEN Operator, LIKE Operator, IN Operator, Ordering Results with ORDER BY Understanding SQL Arithmetic, basic Math operations, ABS() function, POWER() function, SQRT() function, RAND() function, CEILING() function, FLOOR() function, ROUND() function, SUBSTRING() function, Case Conversion Functions, REVERSE() function, TRIM() function, LENGTH() function, SOUNDEX() function, DIFFERENCE() function, DATE() function

**Reference material**


1. Beginning SQL, Paul Wilton and John W. Colby, Published by: Wiley Publishing, Inc.
2. The Complete Reference, James R. Groff and Paul N. Weinberg, McGraw-Hill/Osborne & Learning SQL, ALAN Beaulieu, O'REILLY

| PE-AI-DS-T314A | Social Media Analytics | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | To understand the basic concepts and importance social media analytics, procedure for analysing twitter data and access the same through R platform, procedure for analysing Facebook data and access the same through R platform, procedure for analysing Instagram and access the same through R platform and procedure for analysing GitHub data and access the same through R platform. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Outline the important terminologies and analytics techniques in social media analytics | | | | | | |
| **CO 2** | Analyse the twitter data and conclude the important finding and insights of the society thought on particular issues | | | | | | |
| **CO 3** | Analyse the Facebook data and conclude the important finding and insights of the society thought on particular issues | | | | | | |
| **CO 4** | Analyse the Instagram profile and find out the interesting insights | | | | | | |

**Unit-1**

**Introduction to Social Media Analytics :**Social media and its importance, Various social media platforms, Social media mining, Challenges for social media mining, Social media mining techniques: Graph mining and text mining, The generic process of social media mining

**Unit-2**

**Analytics on Twitter:** Introduction, Twitter and its importance, Understanding Twitter's APIs: Twitter vocabulary, creating a Twitter API connection: Creating a new app, Finding trending topics, Searching tweets, Twitter sentiment analysis: Collecting tweets as a corpus, Cleaning the corpus, Estimating sentiment.

**Unit-3**

**Analytics on Facebook :**Introduction, Creating an app on the Facebook platform, RFacebook package, A basic analysis of your network, Network analysis and visualization, Getting Facebook page data, Trending topics analysis, Influencers: based on single post and multiple post, Measuring CTR performance for a page, Spam detection, Recommendations to friends.

**Unit-4**

**Analytics on Instagram:** Definition and overview Instagram, Creating an app on the Instagram platform, Installation and authentication of the install R package, Accessing data from R, Popular personalities, Overall top users, Most viral media, Finding the most popular destination, Locations with most likes, Clustering the pictures, Recommendations to the users.

**TextBooks:**


1. Mastering Social Media Mining with R– Sharan Kumar Ravindran, Vikram Garg, PACKT Publishing.


**ReferenceBooks:**


2. Social Media Mining with R - Nathan Danneman, Richard Heimann, PACKT Publishing.
3. Social Media Mining An Introduction - Reza Zafarani, Mohammad Ali Abbasi, Huan Liu, Cambridge University Press.

| OE-AI-DS-302A | Inferential Statistics | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | Explain inferential statistics | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Understanding the inferential statistics, hypotheses testing and type-I and type-II error | | | | | | |
| **CO 2** | Test Hypotheses using parametric and non-parametric test | | | | | | |
| **CO 3** | Apply the likelihood ration for point estimation | | | | | | |
| **CO 4** | Analyzeand estimate the parameters | | | | | | |

**Unit-1**

**Introduction to Statistical Inference:** History and development of statistical inference, introduction to statistical hypothesis, types of hypothesis – simple and composite, fundamental concepts of null hypothesis, alternative hypothesis, critical region, two types of statistical errors: type I and II error, importance of type I & II error, level of significance, confidence level and critical region, most powerful test, uniformly most powerful test and their construction, Neyman Pearson Lemma, application and importance of Neyman Pearson Lemma,

**Unit-2**

**Testing of Hypothesis – Parametric Test:** Introduction to Testing of hypothesis, steps I nvolved in Hypothesis testing, small sample test : t test for one sample mean and two sample mean, F test for equality of two variances, Large sample test : Z test, single mean, two mean, single proportion and two proportions, test for the variance of normal distribution, test for the equality of two or more than two normal distributions, confidence interval for population arithmetic mean, confidence interval for population variance

**Unit-3**

**Testing of Hypothesis: Non Parametric test:** Introduction to non-parametric test, run test, Wilcoxon signed Rank Test, Wilcoxon Matched signed pair rank test, Mann-Whiteney U test, Kruskal Wallis test, Fried Man Rank Test for small sample and large sample, Goodness of fit test and independence of attributes using test.

**Unit-4**

**Parameter Estimation:** Introduction to estimation, central limit theorem and its application, types of estimation, properties of good estimator – unbiasedness, consistency, efficiency and sufficiency, Method of estimation – maximum likelihood estimation, properties of method of maximum likelihood estimator

**TextBooks:**


1. Fundamentals of mathematical statistics – SC Gupta and VK Kapoor, Sultan Chand & Sons Publication, New Delhi


**ReferenceBooks:**


1. Introduction to probability Models, Ninth Edition – Sheldon M. Ross, Elsevier Publication, Academic Press, UK .
2. An introduction to Probability and Statistical Inference – George Roussas, Academic Press.

| OE-AI-DS-304A | Management Information System | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | To study of people, technology, organizations, and the relationships among Management Information System | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Relate the basic concepts and technologies used in the field of management information systems; | | | | | | |
| **CO 2** | Compare the processes of developing and implementing information systems. | | | | | | |
| **CO 3** | Outline the role of the ethical, social, and security issues of information systems. | | | | | | |
| **CO 4** | Translate the role of information systems in organizations, the strategic management processes, with the implications for the management. | | | | | | |

**UNIT – I**

Introduction to system and Basic System Concepts, Types of Systems, The Systems Approach, Information System: Definition & Characteristics, Types of information, Role of Information in DecisionMaking, Sub-Systems of an Information system: EDP and MIS management levels, EDP/MIS/DSS.

**UNIT –II**

An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Information requirements & Levels of Management, Simon's Model of decision-Making, Structured Vs Un-structured decisions, Formal vs. Informal systems.

**UNIT – III**

Developing Information Systems: Analysis & Design of Information Systems: Implementation & Evaluation, Pitfalls in MIS Development.

**UNIT – IV**

Functional MIS: A Study of Personnel, Financial and production MIS, Introduction to e-business systems, ecommerce – technologies, applications, Decision support systems – support systems for planning, control and decision-making

**TEXT BOOK**:

1. J. Kanter, “Management/Information Systems”, PHI.
2. Gordon B. Davis, M. H. Olson, “Management Information Systems – Conceptual foundations, structure and Development”, McGraw Hill.

**REFERENCE BOOK**:

1. James A. O’Brien, “Management Information Systems”, Tata McGraw-Hill.
2. James A. Senn, “Analysis & Design of Information Systems”, Second edition, McGraw Hill.
3. Robert G. Murdick& Joel E. Ross & James R. Claggett, “Information Systems for Modern Management”, PHI. 4. Lucas, “Analysis, Design & Implementation of Information System”, McGraw Hill.

| OE-AI-DS-306A | Enterprise Resource Planning | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | To make student able to build an understanding of the fundamental concepts of ERP systems, their architecture, and working of different modules in ERP. Students will also able to develop and design the modules used in ERP systems, and can customize the existing modules of ERP systems. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Develop model for ERP for large projects. | | | | | | |
| **CO 2** | Develop model for E-commerce architecture for any application | | | | | | |
| **CO 3** | Describe the advantages, strategic value, and organizational impact of utilizing an ERP system for the management of information across the functional areas of a business: sales and marketing, accounting and finance, human resource management, and supply chain. | | | | | | |
| **CO 4** | Demonstrate a working knowledge of how data and transactions are integrated in an ERP system to manage the sales order process, production process, and procurement process. | | | | | | |

**Unit-I**

Introduction to ERP: Overview -Benefits of ERP -ERP and Related Technologies - Business Process Reengineering - Data Warehousing - Data Mining -On-line Analytical Processing -Supply Chain Management.

**Unit-II**

ERP Implementation: Implementation Life Cycle -Implementation Methodology - Hidden Costs - Organizing Implementation - Vendors, Consultants and UsersContracts-Project Management and Monitoring.

**Unit-Ill**

Business Modules: Business Modules in an ERP Package-Finance ManufacturingHuman Resource-Plant Maintenance-Materials Management -Quality ManagementSales and Distribution.

**Unit-IV**

ERP Market - ERP Market Place - SAP AG - PeopleSoft-Baan Company –Oracle Corporation. ERP Present and Future: ERP and E-Commerce-ERP and Internet-Future Directions in ERP.

**Recommended Books:**

1. Mary Sumner, Enterprise Resource Planning, Pearson Education (2010).
2. Kogent Learning Solutions Inc., SAP ABAP/4 Covers SAP ECC 6.0 Black Book, Dreamtech Press (2009).
3. Bradford M., Modern ERP Systems: Select Implement and Use Today's Advanced Business Systems (2010).
4. Dreamtech Software Team, SAP Architecture, Administration, Basis, ABAP Programming with MM and SD modules, Dreamtech Press (2005).

| PE-AI-DS-318A | Human AI Interaction | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | To stress the importance of a good interface design.<br>To understand the importance of human psychology in designing good interfaces | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Apply key concepts related to HMI in their day to day activities | | | | | | |
| **CO 2** | Having an ability to design and conduct experiments, as well as to analyze and interpret data | | | | | | |
| **CO 3** | Determine how HMI methods may be used in gaming | | | | | | |
| **CO 4** | Identify how encoding methods works | | | | | | |

**Unit-1**

HCI Foundations : Input–output channels, Human memory, Thinking: reasoning and problem solving, Emotion, Individual differences, Psychology and the design of interactive systems, Text entry devices, Positioning, pointing and drawing, Display devices, Devices for virtual reality and 3D interaction.

**Unit-2**

Designing Interactions Shneideman's eight golden rules, Norman's Seven principles, Screen Design - Visual Display Layout, Information Structuring and Navigation, HCI in Software process, Design Rules, HCI for Users with Disability, Mobile devices, Earcon design for aural interface

**Unit-3**

Interaction Design Models Model Human Processor - Working Memory, Long-Term Memory, Processor Timing, Keyboard Level Model - Operators, Encoding Methods, Heuristics for M Operator Placement, What the Keyboard Level Model Does Not Model, Application of the Keyboard Level Model, GOMS - CMNGOMS Analysis, Modeling Structure, State Transition Networks

**Unit-4**

Interface in HCI Visual Interface, Emotion in HCI, knowledge driven in HCI, Multi-user Interaction, Interface Selection Options, Wire-Framing.

**Text Books:**

1. Gerard Jounghyun Kim, Human Computer Interaction – Fundamentals and Practice, – CRC press, 2015.
2. Regina Bernhaupt , Game User Experience Evaluation-2015 Edition, Kindle Edition
3 Martin Helander, Handbook of Human-Computer Interaction-1988 Elsevier

**References Books:**

1 Julie A. Jacko, The Human–Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications, 3rd Edition, CRC Press (Taylor & Francis Group) 2012.
2 Ben Shneiderman, Catherine Plaisant, Maxine Cohen,Steven Jacobs, Designing the User Interface: Strategies for Effective Human Computer Interaction, 5th Edition, Pearson, 2009.
3 Alan Dix, Janet E. Finlay, Gregory D. Abowd, Russell Beale, Human - Computer Interactio3rd Edition, Pearson, 2003.

| PE-AI-DS-320A | Natural Language Processing | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | Familiarize students with how computer systems will be able to understand, draw inferences from, summarize, translate and generate accurate and natural human text and language. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Understand the key role of syntactic parsing and semantic analysis in natural language processing in unstructured data | | | | | | |
| **CO 2** | Categorize language generation as a part of sentimental analysis. | | | | | | |
| **CO 3** | Evaluate important statistical techniques used in natural language processing | | | | | | |
| **CO 4** | Create corpus for text analysis in natural language processing. | | | | | | |

**UNIT I**

**Introduction to Natural Language Processing:** Introduction, terminologies, challenges of text pre-processing, tokenization, sentence segmentation, lexical analysis, finite state morphonology, finite state morphology, morphology vs lexical analysis, paradigm based lexical analysis.

**UNIT II**

**Syntactic Parsing and Semantic Analysis: S**yntactic parsing, The Cocke–Kasami–Younger Algorithm, Implementing Deductive Parsing, LR Parsing, Constraint-based Grammars, Natural Language Semantics, Relational Issues in Lexical Semantics, Fine-Grained Lexical-Semantic Analysis.

**UNIT III**

**Natural Language Generation:** Introduction, The Components of a Generator, Text Planning, Pushing vs. Pulling, Planning by Progressive Refinement of the Speaker's Message, Text Schemas, The Linguistic Component, Relationship to Linguistic Theory, Chunk Size, Assembling vs. Navigating, Systemic Grammars, Functional Unification Grammars.

**UNIT IV**

**Corpus Creation:** Introduction and definition of corpus in natural language processing, corpus size, Balance, Representativeness, and Sampling, Data Capture and Copyright, Corpus Markup and Annotation, Multilingual Corpora, Multimodal Corpora, Corpus Annotation Types, Morphosyntactic Annotation, Treebanks: Syntactic, Semantic, and Discourse Annotation, The Process of Building Treebanks.

**Text Books**:


1. Hand Book of Natural Language Processing, Second Edition – NITIN INDURKHYA FRED J. DAMERAU, CRC Press
2. Mining Text Data - Charu C. Aggarwal, ChengXiangZhai, Springer
3. Text Mining Classification, Clustering, and Applications - Ashok N. Srivastava, Mehran Sahami, CRC Press.

| PE-AI-DS-316A | High Performance Computing | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | To Study various computing technology architecture.. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Basic knowledge of computing technology. | | | | | | |
| **CO 2** | Student will be able to understand architecture of computing technology. | | | | | | |
| **CO 3** | Student will be able to know cloud computing service models | | | | | | |
| **CO 4** | Student will know about emerging trends in computing technology | | | | | | |

**Unit-1**

**Cluster Computing and its Architecture:** Ease of Computing, Scalable Parallel Computer Architecture, Towards Low Cost Parallel Computing & Motivation, Windows opportunity, A Cluster Computer And Its Architecture

Cluster Classification, Commodity Components for Clusters, Network Services/Communication SW, Cluster Middleware and Single Systems Image, Resource management & Scheduling (RMS)

**Unit-2**

**Cluster Setup and Administration:** Introduction, Setting up the cluster, Security, System Monitoring, System Tuning, Introduction to Grid and its Evolution:, Beginning of the Grid, Building blocks of Grid, Grid Application and Grid Middleware, Evolution of the Grid: First, Second & Third Generation

**Unit-3**

**Introduction to Cloud Computing:** Defining Clouds, Cloud Providers, Consuming Cloud Services, Cloud Models – Iaas, Paas, SaaS, Inside the cloud, Administering cloud services, Technical interface, Cloud resources

**Unit-4**

**Nature of Cloud:** Tradition Data Center, Cost of Cloud Data Center, Scaling computer systems, Cloud work load Managing data on clouds, Public, private and hybrid clouds

**TEXT BOOKS:**

1. High Performance Cluster Computing, Volume 1, Architecture and Systems, Rajkumar Buyya, Pearson Education.
2. Berman, Fox and Hey, Grid Computing – Making the Global Infrastructure a Reality, Wiley India.
3. Hurwitz, Bllor, Kaufman, Halper, Cloud Computing for Dummies, Wiley India.

**REFERENCE BOOKS:**

1. Ronald Krutz, Cloud Security, Wiley India.
2. Cloud Computing, A Practical Approach, Anthony Velte, Toby Velte, Robert Elsenpeter, McGrawHill.

| PE-AI-DS-316LA | High Performance Computing Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Practical** | **Minor Test** | **Total** | **Time** |
| **0** | **0** | **3** | **1.5** | **60** | **40** | **100** | **3 hrs** |
| **Purpose** | To Study various Language Processing Techniques. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Student will learn capabilities and limitations of current natural language technologies | | | | | | |
| **CO 2** | Student will do model linguistic phenomemna with formal grammars. | | | | | | |
| **CO 3** | Student will able to design, implement, and test algorithms for NLP problems. | | | | | | |
| **CO 4** | Student will apply NLP techniques to design real world NLP applications. | | | | | | |

**LIST OF PRACTICALS:**

1 Study and implementation of Processing Text(Word and Sentence tokenization)
2 Study and implementation of Morphological analysis(Stop word removal)
3 Study and implementation of Stemming and Lemmatization.
4 Study and implementation of POS Tagging and Chunking in a sentence
5 Study and implementation of NER(Name entity Recognition)
6 Study and implementation of N-Gram Language Model.
7 Study Wordnet-Lesk Aalgorithm.
8 CASE STUDY:Application of NLP –Sentiment Analysis of tweets in twitter platform.

| AI-DS-308LA | UNIX Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **-** | **-** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | Experimental knowledge of programming skills with expertisation on Unix/Linux platform | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO1** | Learning of simple and advanced commands of Unix /Linux operating systems. | | | | | | |
| **CO2** | Develop shell programming using Bash or any other shell scripts. | | | | | | |
| **CO3** | Develop advanced shell programming skills. | | | | | | |
| **CO4** | Analyzing & evaluation of performance of various c language based programs with the help of Make file & debug utilities. | | | | | | |
| **CO5** | Creation of user accounts, Learning of package installation, backup and shutdown process on Unix /Linux operating systems. | | | | | | |

**List of Practical**

1. Familiarize with Unix/Linux Log In/Log Out and various other commands &vi editor.
2. Develop simple shell programs using Bash or any other shell in Linux.
3. Develop advanced shell programs using grep, fgrep&egrep.
4. Compile and debug various C language based programs using 'makefile' & 'debug' utility.
5. Learning of installation of dual operating systems with Linux having previously installed other window based operating system. Both OSs should be in working operating mode.
6. As Supervisor create and maintain user accounts, learn package installation, taking backups, creation of scripts for file and user management, creation of startup and shutdown scripts using at, batch, cron etc.

**NOTE : At least 8 to 12 more programs exercises based on Unix/Linux platform are to be assigned by the concerned teacher.**

| PE-AI-DS-320LA | Natural Language Processing Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Practical** | **Minor Test** | **Total** | **Time** |
| **0** | **0** | **3** | **1.5** | **60** | **40** | **100** | **3 hrs** |
| **Purpose** | To Study various Language Processing Techniques. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | Student will learn capabilities and limitations of current natural language technologies | | | | | | |
| **CO 2** | Student will do model linguistic phenomemna with formal grammars. | | | | | | |
| **CO 3** | Student will able to design, implement, and test algorithms for NLP problems. | | | | | | |
| **CO 4** | Student will apply NLP techniques to design real world NLP applications. | | | | | | |

**LIST OF PRACTICALS:**

1 Study and implementation of Processing Text(Word and Sentence tokenization)
2 Study and implementation of Morphological analysis(Stop word removal)
3 Study and implementation of Stemming and Lemmatization.
4 Study and implementation of POS Tagging and Chunking in a sentence
5 Study and implementation of NER(Name entity Recognition)
6 Study and implementation of N-Gram Language Model.
7 Study Wordnet-Lesk Aalgorithm.
8 CASE STUDY:Application of NLP –Sentiment Analysis of tweets in twitter platform.

| PE-AI-DS-318LA | Human AI Interaction Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Practical** | **Minor Test** | **Total** | **Time** |
| **0** | **0** | **3** | **1.5** | **60** | **40** | **100** | **3 hrs** |
| **Purpose** | To Study various Human AI Interaction Techniques. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO 1** | To Understand the concept of Artificial intelligence. | | | | | | |
| **CO 2** | To apply knowledge representation and reasoning techniques. | | | | | | |
| **CO 3** | To understand & apply different types of machine learning and models. | | | | | | |
| **CO 4** | To understand the design principles of pattern recognition with estimation and apply classification technique | | | | | | |

**LIST OF PRACTICALS:**

1 Write a program in prolog to implement simple facts and Queries
2 Write a program in prolog to implement simple arithmetic
3 Write a program in prolog to solve Monkey banana problem
4 Write a program in prolog to solve Tower of Hanoi
5 Write a program in prolog to solve 8 Puzzle problems
6 Write a program in prolog to solve 4-Queens problem
7 Write a program in prolog to solve Traveling salesman problem
8 Write a program in prolog for Water jug problem
9. Write a program to implement a Tic-Tac-Toe game.
10.Write a python program to implement simple Chatbot?

**B. Tech Computer Science and Engineering (Artificial Intelligence and Machine Learning)**
**Modified Scheme of Studies/Examination (w.e.f. Session 2023-24)**
**Semester VII**

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC- CS-AIML-401A | Data Science with R Programming | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | HSS-403A | Universal Human Values II: Understanding Harmony | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | OE | OE Elective*-II | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PE | Elective* - I | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5 | PE | Elective* - II | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | PE-LA | Elective* – II Lab | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |
| 7 | PC- CS-AIML-407LA | R Programming Lab | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |
| 8 | PC- CS-AIML-409LA | Project** - 1 | 0:0:10 | 10 | 5 | 0 | 40 | 60 | 100 | 3 |
| 9 | PC- CS-AIML-413LA | Industrial Training*** | 0:0:0 | 0 | 3 | 0 | 100 | 0 | 100 | 3 |
| | | **Total** | | **29** | **25** | **300** | **320** | **180** | **800** | |

| Code | PE Elective*-I | Code | PE Elective* -II |
|---|---|---|---|
| PE- CS- AIML- 415A | Advance Computer Architecture | PE- CS- AIML- 421A | Big Data Analytics for Internet of Things |
| PE- CS- AIML- 417A | Soft Computing | PE- CS- AIML- 423A | Deep Learning |
| PE- CS- AIML- 419A | Data Mining & Predictive Modelling | PE- CS- AIML- 425A | Working with Raspberry pi & Arduino platform |

| Code | PE-LA Elective* –II | Code | OE Elective*-II |
|---|---|---|---|
| PE- CS- AIML-421LA | Big Data Analytics for Internet of Things Lab | OE-CS- AIML-401 | Robotics and Intelligent Systems |
| PE- CS- AIML-423LA | Deep Learning Lab | OE-CS- AIML-403 | Probability for Data Science |
| PE- CS- AIML-425LA | Working with Raspberry pi & Arduino platform Lab | OE-CS- AIML-405 | Cluster Computing |
| | | OE-CS- AIML-407 | Microprocessor |

**Note: *The students will choose any two departmental Electives courses and One Open Elective course out of the given elective list in VII Semester.**
****Project should be initiated in the beginning of 7th semester, and should be completed by the end of 7th semester with good Report and power-point Presentation etc. ***4-6 weeks' hand on training completed after 6th Semester Exams**

| PC-CS-AIML-401A | Data Science with R Programming | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | **To Describe what Data Science is and the skill sets needed to be a data scientist..** | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To understand Basics of Data Science statistics, Identify probability distributions. | | | | | | |
| **CO2** | To perform basics statistical analysis Using R. | | | | | | |
| **CO3** | To Apply basic tools to carry out Exploratory data analysis. | | | | | | |
| **CO4** | To explore the components data science Process to interact via machine learning models. | | | | | | |

**UNIT -I**

Introduction to Data Science - Data Science, History of Data Science, Data Science Process, Benefits and Uses of data science and big data, how does Data Science relate to other fields, data science tools, Data analysis and its types.

Data Preprocessing – Introduction, Data types and forms, Various data preprocessing operations -Data cleaning, data integration, data transformation, data reduction, data discretization.

**UNIT -II**

Data plotting and visualization – Introduction, Data visualization software, Data visualization libraries, Types of data visualization, Basic and specialized data visualization tools.

Statistical Data analysis and probability: Role of statistics and probability in data science, Descriptive statistics – Measures of frequency, central tendency, dispersion, position, Dependence and Independence, Conditional Probability, Bayesian probability, Random Variables, probability distribution

**UNIT -III**

Introduction to R Programming: What is R, Uses, Advantages and disadvantages, Basics in R- Syntax, Comments in R, reserved words, identifiers, constants, variables, operators and its precedence, Strings -Reading strings.

Data types and operations in R: Basic Data types, Vectors, Lists, Matrices, Arrays, Factors, Data Frames, Data type conversion

**UNIT -IV**

Connecting R to external Interfaces: CSV Files: Getting and Setting working Directory, creating, reading, analyzing, writing, Microsoft Excel: Install xlsx package, verifying and loading, creating, reading, writing.

Machine Learning for Data Science: Regression Methods-Linear, polynomial and logistic, classification methods, clustering methods, Hidden Markov Model

Data Science Case studies – Data science in Healthcare, Data Science in Ecommerce, Data Science in Entertainment Industry (preferably on Tableau)

**Reference Books:**


1. R for Data Analysis in Easy Steps by Mike Mc Grath .
2. Beginning Data Science in R: Data Analysis, Visualization, and Modelling for the Data Scientist by Thomas Mailund.
3. The Elements of Statistical Learning, 2nd edition. — Springer, 2009. Hastie, T., Tibshirani, R., Friedman, J.
4. Statistical Analysis with R for Dummies by: Joseph Schmuller.
5. Machine Learning: A Probabilistic Perspective. Murphy, K. - MIT Press, 2012.
6. “Practical Data Science with R”. Nina Zume l, John Mount. Manning, 2014.
7. Advanced R: Data Programming and the Cloud by by: Matt Wiley,Joshua F. Wiley.
8. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython ,2nd edition, Wes McKinney,O’Reilly Media (2017)

| HSS-403A | Universal Human Values II: Understanding Harmony | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3.0** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | Purpose and motivation for the course, recapitulation from Universal Human Values-I | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | Development of a holistic perspective based on self-exploration about | | | | | | |
| **CO 2** | Understanding (or developing clarity) of the harmony in the human being, | | | | | | |
| **CO 3** | Strengthening of self-reflection. | | | | | | |
| **CO 4** | Development of commitment and courage to act. | | | | | | |

**Module 1: Course Introduction - Need, Basic Guidelines, Content and Process for ValueEducation**

1. Purpose and motivation for the course, recapitulation from Universal Human Values-I
2. Self-Exploration– what is it? - Its contentand process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment ofaspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
6. Method to fulfil the above human aspirations: understanding and living in harmony at variouslevels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrarinessin choice based on liking-disliking

**Module 2: Understanding Harmony in the Human Being - Harmony in Myself!**

1. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
2. Understanding the needs of Self ('I') and 'Body' - happiness and physical facility
3. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
4. Understanding the characteristics and activities of 'I' and harmony in 'I'
5. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
6. Programs to ensure Sanyam and Health.

Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease

**Module 3: Understanding Harmony in the Family and Society- Harmony in Human-HumanRelationship**

1. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as thefoundational values of relationship
2. Understanding the meaning of Trust; Difference between intention and competence
3. Understanding the meaning of Respect, Difference between respect and differentiation; the othersalient values in relationship
4. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals
5. Visualizing a universal harmonious order in society- Undivided Society, Universal Order-fromfamily to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives

**Module 4: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence**

1. Understanding the harmony in the Nature
2. Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and self-regulation in nature
3. Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
4. Holistic perception of harmony at all levels of existence.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" canbe used), pollution, depletion of resources and role of technology etc.

**Module 5: Implications of the above Holistic Understanding of Harmony on ProfessionalEthics**

1. Natural acceptance of human values
2. Definitiveness of Ethical Human Conduct
3. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
4. Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people- friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
5. Case studies of typical holistic technologies, management models and production systems
6. Strategy for transition from the present state to Universal Human Order: a. At the level

of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations

7. Sum up.

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. todiscuss the conduct as an engineer or scientist etc.

**READINGS:**

**Text Book**

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books,New Delhi, 2010

**Reference Books**

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J CKumarappa
8. Bharat Mein Angreji Raj - PanditSunderlal
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)

**MODE OF CONDUCT**

Lecture hours are to be used for lecture/practice sessions.

Lectures hours are to be used for interactive discussion, placing the proposals about the topics at handand motivating students to reflect, explore and verify them.

Practice hours are to be used for practice sessions.

While analysing and discussing the topic, the faculty mentor's role is in pointing to essential elements to help in sorting them out from the surface elements. In other words, help the students explore the important or critical elements.

In the discussions, particularly during practice sessions, the mentor encourages the student to connect with one's own self and do self-observation, self-reflection and self-exploration. Scenarios may be used to initiate discussion. The student is encouraged to take up" ordinary" situations rather than" extra-ordinary" situations. Such observations and their analyses are shared and discussed with other students and faculty mentor, in a group sitting.

Practice experiments are important for the course. The difference is that the laboratory is everyday life, and practical are how you behave and work in real life. Depending on the

nature of topics, worksheets, home assignment and/or activity are included. The practice sessions would also provide support to a student in performing actions commensurate to his/her beliefs. It is intended that this would lead to development of commitment, namely behaving and working based onbasic human values.

It is recommended that this content be placed before the student as it is, in the form of a basic foundation course, without including anything else or excluding any part of this content. Additional content may be offered in separate, higher courses.

This course is to be taught by faculty from every teaching department, including HSS faculty. Teacher preparation with a minimum exposure to at least one 8-day FDP on Universal Human Values is deemedessential.

**ASSESSMENT:**

This is a compulsory credit course. The assessment is to provide a fair state of development of the student, so participation in classroom discussions, self-assessment, peer assessment etc. will be used in evaluation.

Example:

Assessment by
faculty mentor: 5 marks
Self-assessment: 5 marks
Assessment by peers: 5 marks
Socially relevant project/Group Activities/Assignments: 10 marks
Semester End Examination: 75 marks
The overall pass percentage is 40%. In case the student fails, he/she must repeat the course.

| OE-CS-AIML-401 | Robotics and Intelligent Systems | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3hrs.** |
| **Purpose** | To impart understanding of the main abstractions and reasoning for Robotics and Intelligent Systems | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To Understand the basic terminologies in Robotics to develop intelligent systems | | | | | | |
| **CO2** | To Apply the random search and heuristic search for intelligent systems. | | | | | | |
| **CO3** | To Understand the abstractions and reasoning for intelligent systems, Apply the rule-based methods in intelligent systems | | | | | | |
| **CO4** | To Identify the characteristics and architectures of algorithms of multi agent systems, Identify different application areas of Intelligent Systems | | | | | | |

**UNIT-I**

Introduction to robotics- History, Characteristics; Robot applications- Manufacturing industry, defense, rehabilitation, medical, Robot mechanisms, type of robots, Basic tasks of a robot, Advantages & Disadvantages of robot, Challenges in Robotics

**UNIT-II**

Components of robot: Robot components, power source, controllers, manipulator, actuator drive and its types, end effector, classifying robots, sensors in robots and its types, transducers, means for programming (Robot programming and interfaces), Degrees of freedom(DOF)

**UNIT-III**

Intelligent Systems: Knowledge acquisition, Computational intelligence, Rule-based systems, Forward-chaining (a data-driven strategy), Conflict resolution, Backward chaining (a goal-driven strategy), Sources of uncertainty, Bayesian updating, Uncertainty theory.

**UNIT-IV**

Possibility theory: fuzzy sets and fuzzy logic, Object-oriented systems, Data abstraction, Inheritance, Encapsulation, Unified Modeling Language (UML), Dynamic (or late) binding.

Key Application Areas: Expert System, Decision Support Systems, Deep Learning: Speech and vision, natural Language processing, Information Retrieval, Semantic Web.

**SUGGESTED BOOKS:**


1. Crina Grosan, Ajith Abraham, “Intelligent Systems: A Modern Approach “, Springer-Verlag, 2011
2. Bogdan M. Wilamowski, J. David Irwin, “The Industrial Electronics Handbook. Second Edition: Intelligent Systems”, CRC Press, 2011
3. Abraham-Kandel, Gideon-Langholz, “Hybrid-Architectures for Intelligent Systems”, CRC-Press, 1992
4. Augmented Human, PAPAGIANNIS, Helen, ist print, SPD.

5. Ian Goodfellow, YoshuaBengio and Aaron Courville, "Deep Learning", MIT Press, http://www.deeplearningbook.org

| OE-CS-AIML-403 | Probability for Data Science | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To understand the foundations of probability and its relationship to statistics and data science. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To Understand the mathematical framework for probability theory | | | | | | |
| **CO2** | To Understand various kinds of Random Variables that are fundamental to probabilistic modeling. | | | | | | |
| **CO3** | To Learn statistical concepts that are fundamental to conducting statistical tests on data and understanding whether the data you are analyzing is likely occurring due to an experimental method or to chance. | | | | | | |
| **CO4** | To Explore some introductory concepts from statistics that are helpful in analyzing data and machine learning. | | | | | | |

**Unit I**

First Tools for looking at data: Datasets, Plotting Data (Bar Charts, Histograms), Summarizing 1D data – (Mean, standard deviation, Variance, median, interquartile range), Plotting 2D data – (categorical data, counts and charts, series, scatter plots for spatial data), Correlation.

**Unit II**

Basic Ideas in probability –Experiments, outcomes and probability, events, independence, conditional probability Random variables and expectations- Random variables, expectations and expected values. Useful probability distributions – Discrete distributions, continuous distributions, normal distribution, approximating binomials with large N

**Unit III**

Samples and populations – The sample mean, confidence intervals, significance of evidence – Significance, evaluating significance, p values, comparing mean of two populations, F tests and standard deviations, Chi square tests of model fit Extracting important relationships in high dimensions – Summaries and simple plots (Mean, stem plots and scatterplot matrices), Using mean and covariance to understand high dimensional data, principal component analysis, multidimensional scaling

**Unit IV**

Regression- regression to make predictions, regression to spot trends, linear regression and least Squares-Linear regression, choosing B, solving least squares problems, residuals, R-squared, producing good linear regressions Markov chains and hidden Markov models

**Textbooks:**

1. Sheldon Ross, Introduction to Probability and Statistics for Engineers, 5/e (2014), Elsevier

**Reference Books:**

1. Morris H. DeGroot and Mark J. Schervish, Probability and Statistics (4/e)(2012), Addison-Wesley.
2. Blitzstein and Hwang, Introduction to Probability (2015), CRC Press.
3. William Feller, An Introduction to Probability, (3/e) (2008), Volume 1, Wiley.

| OE-CS-AIML-405 | Cluster Computing | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | The objective is to learn emerging techniques in Cluster Computing and its applications. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO1** | To Remember and understand the basic concepts/Principles of distributed Systems | | | | | | |
| **CO2** | To Analyze the Various Concepts of Cluster Computing | | | | | | |
| **CO3** | To Able to describe different parallel processing platforms involved in achieving high performance computing | | | | | | |
| **CO4** | To Develop efficient and high performance parallel programming. | | | | | | |

**UNIT I**

Basic concepts in Distributed Systems: Notion of time Distributed Mutual exclusion, Consensus, Failure models Paradigms for process interaction in distributed programs, Programming Paradigms, shared memory, Message passing, Workflows

**UNIT II**

Introduction to Cluster Computing, Cluster Middleware, Early Cluster Architecture and High Throughput Computing Clusters, Networking, Protocols and I/O for Clusters, Setting Up and Administering Cluster, Overview of Cluster Computing, Cluster Computer and its Architecture, Clusters Classifications, Components for Clusters, Cluster Middleware and Single System Image.

**UNIT III**

Cluster Technology for High Availability, Performance Models and Simulation, Process Scheduling, Resource Management and Scheduling, Programming, Environments and Tools, Load Sharing and Load Balancing, Distributed Shared Memory, Cluster Applications, Cluster Systems.

**UNIT IV**

Beowulf Cluster: The Beowulf Model, Application Domains, Beowulf System Architecture, Software Practices, Parallel Programming with MPL, Parallel Virtual Machine(PVM). System Infrastructure, Traditional paradigms for distributed computing, Web Services, Grid standards: OGSA and WSRF, Case Studies of Cluster Systems: COMPaS, NanOS and PARAM

**REFERENCES:**


1. Rajkumar Buyya High Performance Cluster Computing: Architectures and Systems. Prentice-Hall India, 1999.
2. High Performance Cluster Computing: Architectures and Systems, Vol.1, Prentice Hall
3. Grid and Cluster Computing, Prabhu C.S.R, PHIL earning Private Limited
4. In search of clusters(2nded.), Gregory F.Pfister, IBM, Austin, TX, Prentice-Hall
5. Distributed and Cloud Computing, First Edition, Geoffrey C.Fox, KaiHwang, Jack J.Dongarra, Elsevier India Pvt. Ltd.-New Delhi
6. Laurence T.Yang, Minyi Guo – High Performance Computing Paradigm and Infrastructure JohnWiley

| OE-CS-AIML-407 | Microprocessor | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | 3 | 75 | 25 | 100 | **3Hour** |
| **Purpose** | To learn the architecture and programming of Intel family microprocessors and its interfacing. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO1** | To study the Architecture of 8086 microprocessors | | | | | | |
| **CO2** | To implement the interfacing of memories to 8086 Microprocessor | | | | | | |
| **C O3** | To learn and analyze the instruction set of 8086 Microprocessor and implementation of assembly language programming of 8086 Microprocessor. | | | | | | |
| **CO4** | To design and implement the interfacing of interrupts, basic I/O and DMA with 8086 Microprocessor | | | | | | |

**UNIT-I**

8086 CPU ARCHITECTURE: 8086 Block diagram; description of data registers, address registers; pointer and index registers, PSW, Queue, BIU and EU. 8086 Pin diagram descriptions. Generating 8086 CLK and reset signals using 8284. WAIT state generation. Microprocessor BUS types and buffering techniques, 8086 minimum mode and maximum mode CPU module.

**UNIT-II**

Main Memory System Design: Memory devices, 8086 CPU Read/Write timing diagrams in minimum mode and maximum mode. Address decoding techniques. Interfacing SRAMS; ROMS/PROMS. Interfacing and refreshing DRAMS.

**UNIT-III**

8086 Instruction Set: Instruction formats, addressing modes, Data transfer instructions, string instructions, logical instructions, arithmetic instructions, transfer of control instructions; process control instructions; Assembler directives.

8086 Programming Techniques: Writing assembly Language programs for logical processing, arithmetic processing, timing delays; loops, data conversions.

**UNIT-IV**

Basic I/O Interface: Parallel and Serial I/O Port design and address decoding. Memory mapped I/O Vs Isolated I/O Intel's 8255 and 8251- description and interfacing with 8086. ADCs and DACs, - types, operation and interfacing with 8086. Interfacing Keyboards, alphanumeric displays, multiplexed displays, and stepper motor, optical encoder with 8086.

Interrupts and DMA: 8086 Interrupt mechanism; interrupt types and interrupt vector table. Applications of interrupts, Intel's 8259. DMA operation. Intel's 8237.

***Suggested Books:***

1. BarryB.Brey, "TheIntelMicroprocessor8086/8088,80186", PearsonEducation, EighthEdition,2009 1st and 4th Edition

2. D.V. Hall, Microprocessors and Interfacing, McGrawHill2nded.
3. Liu, Gibson, “Microcomputer Systems: The8086/88Family”, 2ndEdition, PHI,2005
4. Kenneth Ayala, “The8086Microprocessor: Programming & Interfacing the PC”, Cengage Learning,
5. Indian Edition, 2008
6. Kip Irvine,” Assembly language for IBM PC”, PHI,2ndEdition,1993, 40% 3rd Edition
7. Peter Abel,” Assembly language programming”, PearsonEdu,5thEdition,2002
8. Uffen back, “The8086FamilyDesign” PHI 1st and 2ndEdition.
9. Walter A Triebel and Avtar Singh; The8088 and8086Microprocessors 4th Edition

| PE-CS-AIML-415A | Advance Computer Architecture | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To enable students to learn various computational models, design paradigms of advanced computer architecture, parallelism approaches and techniques for static and dynamic interconnections. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To Classify and interpret various paradigms, models and micro-architectural design of advanced computer architecture as well as identify the parallel processing types and levels for achieving optimum scheduling | | | | | | |
| **CO2** | To Identify the roles of VLIW & superscalar processors and branch handling techniques for performance improvement | | | | | | |
| **CO3** | To Analyze and interpret the basic usage of various MIMD architectures and relative importance of various types of static and dynamic connection networks for realizing efficient networks. | | | | | | |
| **CO4** | To Examine the various types of processors and memory hierarchy levels and cache coherence problem including software and hardware based protocols to achieve better speed and uniformity. | | | | | | |

## Unit-I

Parallel Computer Models – Introduction to parallel computing, Need for parallel computing, Constraints of conventional architecture, Evolution of parallel processors -Basic terminologies, Features, evolution and future trends, Parallelism in uniprocessor system - Uniprocessor architecture and mechanism, Multiprocessors and multicomputer -UMA, NUMA, COMA and NORMA models, Multivector and SIMD computers

## Unit-II

Parallel Architectural Classification Schemes – Flynn, Feng, Handler classification, classification based on coupling between Processing elements, based on grain size, based on modes of access memory; Instruction level parallelism and thread level parallelism.

Program and Network properties: Introduction, Conditions of parallelism, Types of dependencies, hardware and software parallelism, Program partitioning and scheduling, program flow mechanisms, control flow, data flow, reduction computers

## Unit-III

Parallel Algorithms and Programming – Introduction, characteristics of parallel algorithms, Parallel programming techniques, Models of parallel programming, Classification of parallel algorithms, Performance of parallel algorithms

Vector processing - Introduction, comparison of vector and array processors, basic vector architecture and its classification, Terminologies related to vector processing, vector

instruction types, vector performance modeling, vectorization, Design of a vectorizing compiler

## UNIT – IV

Pipelining – Introduction, Pipeline-Principle and implementation (Linear pipeline processor, Clock period, speed up, efficiency, throughput), Nonlinear pipeline processor, Classification of pipeline processor – Based on levels of processing, based on pipeline configuration, General pipelines, Different pipeline design – multiply and divide pipeline design, Instruction pipeline design, mechanisms for instruction pipelining

**Reference Books:**


1. D.Sima, T.Fountain, P.Kasuk, Advanced Computer Architecture-A Design Space Approach, Pearson Education.
2. Kai Hwang and Naresh Jotwani, Advanced Computer Architecture-Parallelism, Scalability, Programmability, McGraw Hill.
3. M.J. Quinn, Parallel Computing: Theory and Practice, Second Edition, McGraw Hill.
4. J. L. Hennessy and D. A. Patterson, Computer Architecture: A Quantitative approach, Morgan Kaufmann/Elsevier.
5. T.G. Lewis and H. EI- Rewini, Introduction to parallel computing, Prentice Hall.
6. Nicolas Carter, Computer Architecture, McGraw Hill.

| PC-CS-AIML -417A | Soft Computing | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | Soft Computing is a consortium of methodologies which collectively provide a body of concepts and techniques for designing intelligent systems. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO1** | The main objective of the Soft Computing Techniques to Improve Data Analysis | | | | | | |
| **CO2** | Tostrengthenthedialoguebetweenthestatisticsandsoftcomputingresearchcommunitiesin order to cross-pollinate both fields | | | | | | |
| **CO3** | To develop Solutions and generate mutual improvement activities | | | | | | |
| **CO4** | To develop practical data analysis skills, which can be applied to practical problems | | | | | | |

**Unit-I**

Introduction: What is Soft Computing. Difference between Hard and Soft computing, Requirement of Soft computing, Major Areas of Soft Computing, Applications of Soft Computing.

**Unit-II**

Neural Network, Learning rules and various activation functions, Single layer Perceptron, Back Propagation networks, Architecture of Backpropagation (BP) Networks, Backpropagation Learning, Introduction to counter propagation, Adaptive Resonance theory and Self Organizing Map, Recent Applications.

**Unit-III**

Fuzzy Systems: Fuzzy logic, fuzzy sets - properties - operations on fuzzy sets, fuzzy relations - operations on fuzzy relations

Fuzzy membership functions, fuzzification, Methods of membership value assignments – intuition – inference – rank ordering, Lambda – cuts for fuzzy sets, Defuzzification methods

**Unit-IV**

Genetic Algorithm**:** History of Genetic Algorithms(GA), Working Principle, Various Encoding methods, Fitness function, GA Operators-Reproduction, Crossover, Mutation, Convergence of GA, Bitwise operation in GA, Multi-level Optimization, Genetic-neuro hybrid systems, Genetic Fuzzy rule based system

**Suggested Books**:


1. Principles of Soft Computing by S. N. Sivanandam &S. N. Deepa byWiley, India edition. 1st and 2ndEdition
2. Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis & Applications, S.Rajasekaran,G. A. Vijayalakshami, PHI. 2nd and 4th Edition
3. Genetic Algorithms: Search and Optimization, E.Goldberg.
4. Neuro-FuzzySystems,ChinTengLin,C.S.GeorgeLee,PHI.
5. Build_Neural_Network_With_MS_Excel_sample by Joechoong.

| PE-CS-AIML-419A | Data Mining and Predictive Modelling | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | The course provides grounding in basic and advanced methods to learn, how to develop models to predict categorical and continuous outcomes, using such techniques as neural networks, decision trees, logistic regression, support vector machines and Bayesian network models. To know the use of the binary classifier and numeric predictor nodes to automate model selection. To advice on when and how to use each model. Also learn how to combine two or more models to improve prediction. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To learn, how to develop models to predict categorical and continuous outcomes, using such techniques as neural networks, decision trees, logistic regression, support vector machines and Bayesian network models. | | | | | | |
| **CO2** | To know the use of the binary classifier and numeric predictor nodes to automate model selection. | | | | | | |
| **CO3** | To advice on when and how to use each model. Also learn how to combine two or more models to improve prediction. | | | | | | |
| **CO4** | To Apply predictive modeling approaches using a suitable package such as SPSS Modeler | | | | | | |

**Unit 1**

Introduction to Data Mining Introduction, what is Data Mining, Concepts of Data mining, Technologies Used, Data Mining Process, KDD Process Model, CRISP – DM, Mining on various kinds of data, Applications of Data Mining, Challenges of Data Mining.

**Unit 2**

Data Understanding and Preparation Introduction, Reading data from various sources, Data visualization,Distributions and summary statistics, Relationships among variables, Extent of Missing Data. Segmentation, Outlier detection, Automated Data Preparation, combining data files, Aggregate Data, Duplicate Removal, Sampling DATA, Data Caching, Partitioning data, Missing Values.

**Unit 3**

Model development & techniques Data Partitioning, Model selection, Model Development Techniques, Neural networks, Decision trees, Logistic regression, Discriminant analysis, Support vector machine, Bayesian Networks, Linear Regression, Cox Regression, Association rules.

## Unit 4:

Model Evaluation and Deployment Introduction, Model Validation, Rule Induction Using CHAID, Automating Models for Categorical and Continuous targets, Comparing and Combining Models,Evaluation Charts for Model Comparison, MetaLevel Modeling, Deploying Model, Assessing ModelPerformance, Updating a Model.

**Reference Books:**


1. Predictive & Advanced Analytics (IBM ICE Publication)
2. Data Mining: Concepts and Techniques by Jiawei Han
3. Data Mining: Practical Machine Learning Tools and Techniques by Mark A. Hall, Ian H. Witten

| PE-CS-AIML-421A | Big Data Analytics for Internet of Things | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | The course provides grounding in basic and advanced methods to big data technology and tools. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To Understand Big Data and its analytics in the real world. | | | | | | |
| **CO2** | To Analyze the Big Data framework like Hadoop and NOSQL to efficiently store and process Big Data to generate analytics. | | | | | | |
| **CO3** | To Design of Algorithms to solve Data Intensive Problems using MapReduce Paradigm | | | | | | |
| **CO4** | To Design and Implementation of Big Data Analytics using pig and spark to solve data intensive problems and to generate analytics. | | | | | | |

**UNIT I**

Introduction: Big data Concepts, Needs and Challenges of big data. Types and source of big data. Component of system data, access, storage. Data intelligence, Data integration.

**UNIT II**

Distributed file system, Big Data and its importance, Four Vs, Driversfor Big data, big data analytics, big data applications. Algorithms using map reduce, Matrix-VectorMultiplicationby Map Reduce.

**UNIT III**

Introduction to Hadoop- Big Data – Apache Hadoop & Hadoop EcoSystem – Moving Data in and out of Hadoop– Understanding inputs and outputs of Map Reduce-Data Serialization.

**UNIT IV**

Hadoop Architecture - Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands, Anatomy of File Write and Read. Name Node, Secondary Name Node, and Data Node, Hadoop Map Reduce.

**Reference Books:**


1. Borislublinsky,Kevint.Smith,AlexeyYakubovich,

“ProfessionalHadoopSolutions”, Wiley, ISBN:9788126551071,2015.

2. ChrisEaton,Dirkderoos, etal.,“UnderstandingBigdata”,McGrawHill,2012.

3. TomWhite, “HADOOP: ThedefinitiveGuide”, OReilly2012.

4. VigneshPrajapati, “BigDataAnalyticswithRandHadoop”, PacketPublishing2013.

| PE-CS-AIML-423A | Deep Learning | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | The course provides grounding in basic and advanced methods to understand the theoretical foundations, algorithms and methodologies of Neural Network. To design and develop an application using specific deep learning models. To provide the practical knowledge in handling and analysing real world applications. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To Recognize the characteristics of deep learning models that are useful to solve real-world problems. | | | | | | |
| **CO2** | To Understand different methodologies to create application using deep nets. | | | | | | |
| **CO3** | To Identify and apply appropriate deep learning algorithms for analyzing the data for variety of problems. | | | | | | |
| **CO4** | To Implement different deep learning algorithms. Design the test procedures to assess the efficacy of the developed model. Combine several models in to gain better results | | | | | | |

**Unit:1**

Basics of Machine Learning algorithms, Maximum likelihood estimation, Building machine learning algorithm, Neural Networks Multilayer Perceptron, Back-propagation algorithm and its variants Stochastic gradient decent, Curse of Dimensionality

**Unit 2**

Deep Learning Architectures, Representation Learning, Width and Depth of Neural Networks, Activation Functions: RELU, LRELU, ERELU, Unsupervised Training of Neural Networks, Restricted Boltzmann Machines, Auto Encoders, Deep Learning Applications

**Unit 3**

Convolutional Neural Networks, Architectural Overview, Motivation, Layers, Filters, Parameter sharing, Regularization, Popular CNN Architectures: ResNet, AlexNet - Applications

**Unit 4**

Transfer Learning Techniques, Variants of CNN: DenseNet, PixelNet, Recurrent Neural Networks, Bidirectional RNNs, Encoder-decoder sequence to sequence architectures - BPTT for training RNN, Long Short Term Memory Networks.

**TEXT BOOKS**

1.Ian Goodfellow, YoshuaBengio and Aaron Courville, “Deep Learning”, MIT Press, 2017.
2. Josh Patterson, Adam Gibson "Deep Learning: A Practitioner's Approach", O'Reilly Media, 2017
3. Umberto Michelucci “Applied Deep Learning. A Case-based Approach to Understanding DeepNeural Networks” Apress, 2018.

**Reference Books**

1. Kevin P. Murphy "Machine Learning: A Probabilistic Perspective ", The MIT Press, 2012.
2. EthemAlpaydin, "Introduction to Machine Learning”, MIT Press, Prentice Hall of India, Third
Edition 2014.
3.Giancarlo Zaccone, Md. RezaulKarim, Ahmed Menshawy"Deep Learning with TensorFlow:

| PE-CS-AIML-425A | Working with Raspberry pi & Arduino platform | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | The course provides the IOT related infrastructure and various IOT devices. This course will help you know about the embedded system, IOT architecture. To understand the various applications and future aspects of IOT world. This course will help to do various Arduino related projects like intelligent home locking system. Along with Arduino, in the later on sections, we will study Raspberry pi. Sensors and actuators related to raspberry pi and various applications and related projects. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To learn the embedded system and their working and IOT fundamentals. | | | | | | |
| **CO2** | To know the use of Arduino and its basic concepts. Also understand the various Arduino based projects. | | | | | | |
| **CO3** | To understand the raspberry Pi and programming done with it. | | | | | | |
| **CO4** | To Apply programming and hardware interfaces with Raspberry Pi and various projects. | | | | | | |

**Unit I**

Introduction to embedded system, Understanding Embedded System, Overview of basic electronics and digital electronics, Microcontroller vs. Microprocessor, Common features of Microcontroller, Different types of microcontrollers, Overview of IoT, Understanding IoT fundamentals, IoT Architecture, protocols, Various Platforms for IoT, Real time Examples of IoT, Overview of IoT components and IoT Communication Technologies

**Unit II**

Getting Started with Arduino: Introduction to Arduino, Pin configuration and architecture., Device and platform features, Concept of digital and analog ports, Arduino Basic Concepts: Arduino data types, Variables and constants, Operators, Control Statements, Arrays, Functions

Arduino Projects: Intelligent home locking system, Intelligent water level management system, Home automation using RFID, Real time clock-based home automation, Intelligent Automatic Irrigation System

**Unit III**

Getting Started with Raspberry Pi: Basic functionalities of Raspberry Pi board and its processor, Pin Description of Raspberry Pi, Understanding SoC architecture and SoCs used in Raspberry Pi

Programming the Raspberry Pi: Python: Introduction to Python Programming language, Python vs Other Languages, Python Programming Environment, Variables, Keywords, Data Types in Python, Loops, Conditional Statement, Function, Function Argument, Flow Control,

Numpy, Importing Libraries, PIP (Python Installation Package) and Customized libraries, Application of Pythons

**Unit IV**

Interfacing of Sensors and Actuators with RPi:Temperature and Humidity Sensor (DHT11), Motion Sensor (PIR), Obstacle detection using Ultrasonic sensor, etc.Robotics Motion Raspberry Pi: DC, Servo, Stepper Motor, Camera Interfacing

**References Books:**


**1**. Arduino Cookbook by Michael Margolis, O'Reilly Media, Inc., 1st edition.

2. Arduino for beginners: Essential Skills Every Maker Needs, John Baichtal, Person Education, Inc., 1st edition

3.Raspberry Pi 3 An Introduction to Using with PythonScratch, Javascript and more, Gary Mitnick, CreateSpace Independent Publishing Platform, 2017.

4.Raspberry Pi for Python Programmers Cookbook, Tim Cox, Packt Publishing Limited; 2nd Revised edition, 2016.

5.Raspberry Pi User Guide, Eben Upton and Gareth Halfacreee, John Wiley & Sons, 2016.

6. Internet of Things – A hands-on approach, Arshdeep Bahga, Vijay Madisetti, Universities Press, 2015

7. Raj Kamal, “Internet of Things: Architecture and Design Principles”, 1st Edition, McGraw Hill Education,2017.

| PE-CS-AIML-421LA | Big Data Analytics for Internet of Things Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | **To Describe what Data Science is and the skill sets needed to be a data scientist..** | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Install and use R for simple programming tasks. Extend the functionality of R by using add-on packages. | | | | | | |
| **CO2** | To perform basics statistical analysis Using R. | | | | | | |
| **CO3** | To Apply basic tools to carry out Exploratory data analysis. | | | | | | |
| **CO4** | To explore the components data science Process to interact via machine learning models. | | | | | | |

LIST OF PRACTICALS

1. Installation of Single Node Hadoop Cluster on Ubuntu
2. Hadoop Programming: Word Count Map Reduce Program Using Eclipse
3. Implementing Matrix Multiplication Using One Map-Reduce Step.
4. Implementing Relational Algorithm on Pig.
5. Implementing database operations on Hive.
6. Implementing Bloom Filter using Map-Reduce
7. Implementing Frequent Item set algorithm using Map-Reduce.
8. Implementing Clustering algorithm using Map-Reduce
9. Implementing Page Rank algorithm using Map-Reduce
10. Mini Project:

    Few topics for Projects:

    a. Twitter data analysis

    b. Fraud Detection

    c. Text Mining

    d. Equity Analysis etc.

| PC-CS-AIML-423LA | Deep learning Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | **To Describe what Data Science is and the skill sets needed to be a data scientist..** | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To understand the deep learning. | | | | | | |
| **CO2** | To perform basics deep learning networks | | | | | | |
| **CO3** | To apply various deep learning networks in real world life.. | | | | | | |
| **CO4** | To implement deep learning modules. | | | | | | |

LIST OF PRACTICALS

1. Write a program to implement different activation functions to train Neural Network.

2. Write a program to implement different Learning Rules.

3. Write a program to implement Perceptron Networks.

4. Write a program to implement Adaline network for system identification.

5. Write a program to implement Madaline network

6. Write a program to implement Pattern matching using different rules.

7. Create a project that focuses on how machine learning is used in healthcare.

8. Project related to application of machine learning in business analysis.

9. Project related to application of machine learning in sports analytics.

10. Project related to application of machine learning in Time Series Analysis & Forecasting.

| PE-CS-AIML-425LA | Working with Raspberry pi & Arduino platform Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | **To describe what Data Science is and the skill sets needed to be a data scientist.** | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To understand the Raspberry Pi. | | | | | | |
| **CO2** | To perform basics practicals using Arduino platform | | | | | | |
| **CO3** | To apply various Raspberry pi & Arduino platform in real world life.. | | | | | | |
| **CO4** | To implement and connect with MySQL database | | | | | | |

LIST OF PRACTICALS

1. Study and installation of Raspberry- pi

2. To write a program to sense the available networks using Arduino

3. To write a program to measure the distance using ultrasonic sensor and make LED blink using Arduino.

4. To write a program to detects the vibration of an object with sensor using Arduino.

5. To write a program to connect with the available Wi-Fi using Arduino

6. To write a program to sense a finger when it is placed on the board Arduino.

7. To write a program to get temperature notification using Arduino.

8. To write a program for LDR to vary the light intensity of LED using Arduino.

9. To write a program to install MySQL database in Raspberry pi.

10. To write a program to work with basic MySQL queries by fetching data from database in Raspberry pi.

11. To write a program to switch light on when the input is 1 and switch the light off when the input is 0 using Raspberry

Raspberry Pi Projects: Set up a Pi motion detector, set up Pi ADC/DAC, construct a digital weather station, construct a traffic light controller.

| PC-CS-AIML-407LA | R Programming lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | **To Describe what Data Science is and the skill sets needed to be a data scientist..** | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Install and use R for simple programming tasks. Extend the functionality of R by using add-on packages. | | | | | | |
| **CO2** | To perform basics statistical analysis Using R. | | | | | | |
| **CO3** | To Apply basic tools to carry out Exploratory data analysis. | | | | | | |
| **CO4** | To explore the components data science Process to interact via machine learning models. | | | | | | |

## LIST OF PRACTICALS

1. Write an R script, to create R objects for calculator application and save in a specified location in disk.

2. Write an R script to find basic descriptive statistics using summary, str, quartile function on sample datasets.

3. Write an R script to find subset of dataset by using subset (), aggregate () functions on sample dataset.

4. Write an R script for Reading different types of data sets (.txt, .csv) from web and disk and writing in file in

specific disk location.

5. Write an R script for Reading Excel data sheet and XML dataset.

6. Find the data distributions using box and scatter plot of sample dataset.

a. Find the outliers using plot.

b. Plot the histogram, bar chart and pie chart on same data.

7. How to find a correlation matrix and plot the correlation on sample data set.

a. Plot the correlation plot on dataset and visualize giving an overview of relationships among data

b. Analysis of covariance: variance (ANOVA), if data have categorical variables

8. Import a data from web storage. Name the dataset and now do Logistic Regression to find out relation between variables that are affecting the admission of a student in a institute based on his or her GRE score, GPA obtained and rank of the student. Also check the model is fit or not. require (foreign), require(MASS).

9. Apply multiple regressions, if data have a continuous independent variable. Apply on above dataset (in Que

10. Apply regression Model techniques to predict the data on above dataset (in Que 8).

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC-CS-AIML-409LA | Project**-I | 0:0:10 | 10 | 5 | 0 | 40 | 60 | 100 | 3 hours |

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC-CS-AIML-413LA | Industrial Training*** | 0 | 0 | 3 | 0 | 100 | 0 | 100 | 3 hours |

**B. Tech Computer Science and Engineering (Artificial Intelligence and Machine Learning)**
**Modified Scheme of Studies/Examination (w.e.f. Session 2023-24)**
**Semester VIII**

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC- CS- AIML-402A | Optimization Method in ML | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | HSS-404A | Entrepreneurship and Start-ups | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | OE | OE Elective*-III | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | PE | Elective* – III | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 |
| 4 | PE | Elective* - IV | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 |
| 5 | PC- CS- AIML-406LA | Optimization Lab | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |
| 6 | PC- CS- AIML-408LA | Advance AI Application Lab | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |
| 7 | PC- CS- AIML-410LA | Project**-II | 0:0:10 | 10 | 5 | 0 | 100 | 100 | 200 | 3 |
| 8 | HM- CS- AIML-412A | General Fitness & Proficiency | 0:0:0 | 0 | 0 | 0 | 0 | 100 | 100 | 3 |
| | | **Total** | | **27** | **20** | **300** | **280** | **320** | **900** | |

| Code | PE-Elective* III | Code | PE-Elective* IV |
|---|---|---|---|
| PE- CS- AIML- 402A | Reinforcement Learning | PE- CS- AIML- 422A | Augmented Reality |
| PE- CS- AIML- 416A | Social Networks | PE- CS- AIML- 424A | Advance Machine Learning |
| PE- CS- AIML- 420A | Neural Network and Fuzzy Logic systems | PE- CS- AIML- 426A | Natural Language Processing |

| Code | OE Elective*-III |
|---|---|
| OE-CS-AIML-402 | Cyber Law and Ethics |
| OE-CS-AIML-404 | Cryptographic Fundamentals |
| OE-CS-AIML-406 | Network Operating System |
| OE-CS-AIML-408 | Reasoning, Problem Solving and Robotics |
| OE-CS-AIML-410 | Image Processing and Recognition |

**Note: *The students will choose any two departmental Electives courses and One Open Elective course out of the given elective list in VIII Semester.**
****Project should be initiated in the beginning of 8$^{th}$semester, and should be completed by the end of 8$^{th}$semester with good Report and power-point Presentation etc.**

| PC-CS-AIML-402A | Optimization Method in ML | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To equip students with advanced techniques and methods in optimization that are tailored to large-scale statistics and machine learning problems | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To understand the basics of convex optimization. | | | | | | |
| **CO2** | To learn the basics of gradient based methods. | | | | | | |
| **CO3** | To apply the operator's splitting methods. | | | | | | |
| **CO4** | To know about stochastic and non-convex optimization dual averaging. | | | | | | |

**UNIT I**

Basics of convex optimization: convex sets, convexity-preserving operations, examples of convex programs (linear programming (LP), second-order cone programming (SOCP), semi-definite programming (SDP)), convex relaxation, KKT conditions, duality

**UNIT II**

Gradient-based methods: gradient descent, sub-gradient, mirror descent, Frank–Wolfe method, Nesterov's accelerated gradient method, ODE interpretations, dual methods, Nesterov's smoothing, proximal gradient methods, Moreau–Yosida regularization

**UNIT III**

Operator splitting methods: Augmented Lagrangian methods, alternating direction method of multipliers (ADMM), monotone operators, Douglas–Rachford splitting, primal and dual decomposition

**UNIT IV**

Stochastic and non-convex optimization dual averaging, Polyak–Juditsky averaging, stochastic variance reduced gradient (SVRG), Langevin dynamics, escaping saddle points, landscape of non-convex problems, deep learning

**Suggested Books:**


1. Optimization in Machine Learning and Applications, Anand J. Kulkarni, Suresh Chandra Satapathy, 2019
2. Linear Algebra and Optimization for Machine Learning, Charu C. Aggarwal, 2020.

| HSS-404A | Entrepreneurship and Start-ups | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To expose students to the joys and skills of being an entrepreneur. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To understand the basics of Entrepreneurship | | | | | | |
| **CO2** | To learn the basics of Creative and Design Thinking | | | | | | |
| **CO3** | To apply the Business Enterprises | | | | | | |
| **CO4** | To know about business models | | | | | | |

**Unit I**

Introduction to Entrepreneurship, Meaning and concept of entrepreneurship, the history of entrepreneurship development, role of entrepreneurship in economic development, Myths about entrepreneurs, types of entrepreneurs.

**Unit II**

The skills/ traits required to be an entrepreneur, Creative and Design Thinking, the entrepreneurial decision process, entrepreneurial success stories.

**Unit III**

Crafting business models and Lean Start-ups: Introduction to business models; Creating value propositions-conventional industry logic, value innovation logic; customer focused innovation; building and analysing business models; Business model canvas, Introduction to lean start-ups, Business Pitching.

**Unit IV**

Institutions Supporting Small Business Enterprises: Central level institutions. State level institutions. Other agencies. Industry Associations. Class exercise- discussions on current government schemes supporting entrepreneurship and finding out which scheme will most suit the business plan devised by the student.

Text Books:


- Kuratko, D , Hornsby J.S. (2017) New Venture Management: Entrepreneur's roadmap
- Hisrich, R.D., Manimala, M.J., Peters, M.P., Shepherd, D.A.: Entrepreneurship, Tata McGraw Hill
- Ries, Eric(2011)The lean Start-up: How constant innovation creates radically
- S. Carter and D. Jones-Evans (2012), Enterprise and small business- Principal Practice and Policy, Pearson Education (2006)

Reference books:


- Guillebeau, C (2015) The $100 Startup: Fire Your Boss, Do What You Love and Work Better To Live
- Prasad, Rohit (2013), Start-up sutra: what the angels won't tell you about business and life, Hachette India.
- Charantimath, P. (2009). Entrepreneurship Development: Small Business Enterprises. Pearson

| OE-CS-AIML-402 | Cyber Law and Ethics | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | The course deals with all the aspects of Cyber law as per Indian/IT act. It also covers overview of Cyber Ethics, Intellectual Property Right and Trademark Related laws with respect to Cyber Space. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | To give overview of Cyber Ethics, Intellectual Property Right and Trademark Related laws with respect to Cyber Space. | | | | | | |
| **CO 2** | To analyze and evaluate existing legal framework and laws on cyber security. | | | | | | |
| **CO 3** | To analyze and evaluate the Intellectual rights and copyrights. | | | | | | |
| **CO 4** | To understand cyber ethics. | | | | | | |

**Unit-1: Introduction to Cyber Law**

Evolution of computer technology, emergence of cyber space. Cyber Jurisprudence, Jurisprudence and law, Doctrinal approach, Consensual approach, Real Approach, Cyber Ethics, Cyber Jurisdiction, Hierarchy of courts, Civil and criminal jurisdictions, Cyberspace-Web space, Web hosting and web Development agreement, Legal and Technological Significance of domain Names, Internet as a tool for global access.

**Unit-2: Information Technology Act**

Overview of IT Act, 2000, Amendments and Limitations of IT Act, Digital Signatures, Cryptographic Algorithm, Public Cryptography, Private Cryptography, Electronic Governance, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature, Certifying Authorities, Cyber Crime and Offences, Network Service Providers Liability, Cyber Regulations Appellate Tribunal, Penalties and Adjudication.

**Unit-3: Cyber Law and Related Legislation**

Patent Law, Trademark Law, Copyright, Software – Copyright or Patented, Domain Names and Copyright disputes, Electronic Data Base and its Protection, IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code, Relevant Sections of Indian Evidence Act, Relevant Sections of Bankers Book Evidence Act, Relevant Sections of Indian Penal Code, Relevant Sections of Reserve Bank of India Act, Law Relating To Employees And Internet, Alternative Dispute Resolution , Online Dispute Resolution (ODR).

**Unit-4: Cyber Ethics**

The Importance of Cyber Law, Significance of cyber Ethics, Need for Cyber regulations and Ethics. Ethics in Information society, Introduction to Artificial Intelligence Ethics: Ethical Issues in AI and core Principles, Introduction to Block chain Ethics.

**Suggested Books:**

1. Cyber Security : Understanding Cyber Crimes , Computer Forensics and Legal Perspectives By Nina Godbole, Sunit Belapur , Wiley
2. Understanding cybercrime: phenomena , and legal challenges response, ITU 2012.

| OE-CS-AIML-404 | Cryptographic Fundamentals | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | To Understand various cryptographic algorithm, public-key cryptosystem and fundamental ideas of public-key cryptography. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO1** | To Student will be able to understand basic cryptographic algorithms. | | | | | | |
| **CO2** | To Able to understand the fundamental ideas of public-key cryptography. | | | | | | |
| **CO3** | To Analyze and compare symmetric-key encryption public-key encryption schemes based on different security models | | | | | | |
| **CO4** | To Able to understand the PKI infrastructure. | | | | | | |

**Unit-I**

Cryptography Concept: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks Historical Ciphers, Computational Security, Semantic Security, Pseudorandom Generators (PRGs) PRF, PRP and SPRP.

**Unit-II**

Symmetric key Ciphers: Block Cipher principles, Modes of Operations of Block Ciphers, DES, AES, Stream ciphers.

Cryptographic Hash Functions**:** MAC, Information-theoretic Secure MAC, Cryptographic Hash Functions, Birthday Attacks on Cryptographic Hash Functions, Applications of Hash Functions, Generic Constructions of Authenticated Encryption Schemes.

**Unit-III**

Asymmetric key Ciphers: Discrete-Logarithm Problem, Computational Diffie-Hellman Problem, Decisional Diffie-Hellman Problem, Elliptic-Curve Based Cryptography and Public-Key Encryption, El Gamal Encryption Scheme, RSA Assumption, CCA -secure Public-key Hybrid Ciphers Based on Diffie-Hellman Problems and RSA-assumption, Digital Signatures.

**Unit-IV**

Key Management and Distribution: Symmetric Key Distribution Using Symmetric & Asymmetric Encryption, Distribution of Public Keys, Kerberos, X.509 Authentication Service, Public – Key Infrastructure, overview of SSL/TLS.

**Suggested Books:**

1. Cryptography and Network Security: Forouzan Mukhopadhyay, Mc Graw Hill, 1st and 2nd Edition.
2. Katz and Y. Lindell, Introduction to Modern Cryptography, CRC press, 2020. 1st and 4th Edition
3. Cryptography and Network Security - Principles and Practice: William Stallings, Pearson Education, 6th Edition

| OE-CS-AIML-406 | Network Operating System | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hr.** |
| **Course Outcomes** | | | | | | | |
| **CO1** | To Identify the features of modern Microsoft operating systems including UNIX and UNIX-like operating systems. | | | | | | |
| **CO2** | To Explain the fundamentals of operating system and its use in network communication. | | | | | | |
| **CO3** | To Analyze how to manage user accounts, group accounts, and shared resources. | | | | | | |
| **CO4** | To Devise a security policy for your client and server computers. | | | | | | |

**Unit-1**

Computer basics—Understanding operating systems, Fundamentals of operating systems, Functions of operating system,Types, Resource Management, Operating system basics

**Unit-2**

Modern Client and Server Operating Systems, client server model, Concepts of Linux, OS Alternatives and Recommendations, Account and Resource Management

**Unit-3**

Central processing unit (CPU), file system, Types of Computer File Systems and How They Work, Examples, Linux File System/Structure, Understanding active directory and group policy

**Unit-4**

Network operating system, Types of operating system, Network Fundamentals and Configuration, The Next Platform - one network operating system to unite them all, Securing and Maintaining an Operating System

**References:**


1. GCF Global. (n.d.). Computer basics—Understanding operating systems.
2. Operating system by Galvin
3. Computer Networks by Andrew S. Tanenbaum,1981
4. Kindson the Tech Pro. (2020, October 2). Windows Server 2019 Administration Complete Course – 2020
5. Kottayil, N.K. (2020, August 14). Central processing unit (CPU). Techopedia.

| OE-CS-AIML-408 | Reasoning, Problem Solving and Robotics | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | The course provides grounding in basic and advanced method how to solve problem | | | | | | |
| **Course Outcomes –At the end of this course students will be able to:** | | | | | | | |
| **CO1** | To list and explain the basic elements of robots | | | | | | |
| **CO2** | To analyze robot kinematics and its control methods | | | | | | |
| **CO3** | To Classify the various sensors used in robots for better performance | | | | | | |
| **CO4** | To summarize various industrial and non-industrial applications of robots | | | | | | |

**UNIT-I**

Introduction to Robot- Basic concepts, Need, Law, History, Anatomy, specifications. Robot configurations- Cartesian, cylinder, polar and articulate. Robot wrist mechanism, Precision and accuracy of robot.

**UNIT-II**

End Effectors-Classification, Types of Mechanical actuation, Gripper design, Robot drive system Types, Position and velocity feedback Devices-Robot joints and Links-Types, Motion interpolation. Robot kinematics – Basics of direct and inverse kinematics, Robot trajectories, 2D and 3D Transformation-Scaling, Rotation, Translation Homogeneous transformation.

**UNIT-III**

Sensors in robot – Touch Sensors-Tactile sensor – Proximity and range sensors. Force Sensor-Light sensors, Pressure sensors, Introduction to Machine Vision and Artificial Intelligence

**UNIT-IV**

Control of robot manipulators – Point to point, Continuous Path Control, Robot programming. applications of robots, Medical, Household, Entertainment, Space, Underwater, Defense, Disaster management. Applications, Micro and Nanorobots, Future Applications.

**Reference Book:**

1. Mikell P. Groover, Mitchell Weiss, Roger N Nagel, Nicholas G Odrey, “Industrial Robotics Technology, Programming and Applications”, Tata –McGraw Hill Pub. Co., 2008. Half 1st
2. Deb.S.R and Sankha Deb, "Robotics Technology and Flexible Automation", Tata McGraw Hill Publishing Company Limited, 2010. 1st and 4th Edition
3. Klafter.R.D, Chmielewski.T.A, and Noggin’s., “Robot Engineering: An Integrated Approach”’, Prentice Hall of India Pvt. Ltd., 1994. 3rd Edition
4. Fu.K.S, Gonzalez.R.C&Lee.C.S.G, “Robotics control, sensing, vision and intelligence”, Tata- McGraw Hill Pub. Co., 2008
5. Yu. “Industrial Robotics”, MIR Publishers Moscow, 1985.

| OE-CS-AIML-410 | Image Processing and Recognition | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | To imparts knowledge in the area of image and image processing, fundamentals of digital image processing and also to learn the fundamentals of pattern recognition and to choose an appropriate feature. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO 1** | To Understand Basics of Image formation and transformation using sampling and quantization | | | | | | |
| **CO 2** | To Understand different types signal processing techniques used for image sharpening and smoothing | | | | | | |
| **CO 3** | To understand the nature and inherent difficulties of the pattern recognition problems. | | | | | | |
| **CO 4** | Understand concepts, trade-offs, and appropriateness of the different feature types and classification techniques such as Bayesian, maximum likelihood, etc | | | | | | |

**Unit-I**

Introduction to image processing and restoration, Image formation, image geometry perspective and other transformation, stereo imaging elements of visual perception. Digital Image-sampling and quantization serial & parallel Image processing**,** Image Restoration-Constrained and unconstrained restoration Wiener filter, Motion blur remover.

**Unit-II**

Segmentation Techniques-thresh holding approaches, region growing, relaxation, line and edge detection approaches, edge linking, supervised and unsupervised classification techniques, remotely sensed image analysis and applications, Shape Analysis – Gestalt principles, shape number, moment Fourier and other shape descriptors, Skelton detection.

## Unit-III

Pattern Recognition, Basics of pattern recognition, Design principles of pattern recognition system, Learning and Adaption, Pattern recognition approaches,Mathematical Foundation-Linear Algebra, Probablity theory, Expectation, mean, covariance,NormalDistribution, Multivariate normal densities, chi square test.
Bayesian Decision Theory, Classifiers, Normal density and discriminant functions, Parameter estimation methods: Maximum-Likelihood estimation, Bayesian Parameter estimation

## Unit-IV

Statistical pattern recognition: Dimension reduction methods – Principal Component Analysis (PCA), Fisher Linear discriminant analysis, Expectation-maximization (EM), Hidden Markov Models (HMM), Gaussian mixture models.

**Suggested Books**


1. Digital Image Processing – Ganzalez and Wood, Addison Wesley, 1993.
2. Fundamental of Image Processing – Anil K.Jain, Prentice Hall of India.
3. Pattern Classification – R.O. Duda, P.E. Hart and D.G. Stork, Second Edition John Wiley, 2006
4. An Introduction to Digital Image Processing – Wayne Niblack, Prentice Hall, 1986
5. Pattern Recognition and Machine Learning – C. M. Bishop, Springer, 2009.
6. Pattern Recognition – S. Theodoridis and K. Koutroumbas, 4th Edition, Academic Press,2009

| PE-CS-AIML-402A | Reinforcement Learning | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 hrs.** |
| **Purpose** | Purpose To provide knowledge of various Reinforcement Learning Algorithms | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| CO 1 | To learn the basics of Reinforcement Learning concepts, various Reinforcement Learning architecture | | | | | | |
| CO 2 | To explore knowledge of various process of Reinforcement Learning | | | | | | |
| CO 3 | To understand the basics of Reinforcement Learning models | | | | | | |
| CO 4 | To implies about the different Reinforcement Learning algorithms and their applications to solve real world problems. | | | | | | |

**UNIT-1**

Introduction to Reinforcement Learning: Origin and history of Reinforcement Learning research. Its connections with other related fields and with different branches of machine learning, The Reinforcement Learning Process Elements of Reinforcement Learning RL Agent Taxonomy Reinforcement Learning Problem.

**Unit-II**

Markov Decision Process: Introduction to RL terminology, Markov property, Markov chains, Markov reward process (MRP). Introduction to and proof of Bellman equations for MRPs along with proof of existence of solution to Bellman equations in MRP. Introduction to Markov decision process (MDP), state and action value functions, Bellman expectation equations, optimality of value functions and policies, Bellman optimality equations.

**Unit-III**

Monte Carlo Methods for Model Free Prediction and Control: Overview of Monte Carlo methods for model free RL, First visit and every visit Monte Carlo, Monte Carlo control, On policy and off policy learning, Importance sampling.
TD Methods Incremental Monte Carlo Methods for Model Free Prediction, Overview TD (0), TD (1) and TD(λ), k-step estimators, unified view of DP, MC and TD evaluation methods, TD Control methods - SARSA, Q-Learning and their variants.

**Unit-IV**

Function Approximation Methods: Getting started with the function approximation methods, Revisiting risk minimization, gradient descent from Machine Learning, Gradient MC and Semi-gradient TD (0) algorithms, Eligibility trace for function approximation, Afterstates, Control with function approximation, least squares, Experience replay in deep Q-Networks

**Suggested Book:** Richard S. Sutton and Andrew G. Barto "An Introduction to Reinforcement Learning Enes Bilgin " Mastering Reinforcement Learning with Python: Build next-generation, self-learning models using reinforcement learning techniques and best practices" 1st Edition Kindle

| PE-CS-AIML-416A | Social Networks | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | Students will be able to use Social networks for business and personal use, conducting social network analysis, social network developer tools and social network concepts for solving real-world issues. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To Demonstrate proficiency in the use of social networks for business and personal use | | | | | | |
| **CO2** | To Demonstrate proficiency in the use of social network analysis concepts and techniques. | | | | | | |
| **CO3** | To Demonstrate proficiency in the use of social network developer tools. | | | | | | |
| **CO4** | To Examine the various types of processors and demonstrate proficiency in the use of social network concepts for solving real world issues. | | | | | | |

**Unit-1**

Introduction to Semantic Web: Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - Social Network analysis: Development of Social Network Analysis - Key concepts and measures in network analysis - Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities - Web-based networks - Applications of Social Network Analysis.

**Unit-2**

Ontology and their role in the Semantic Web: Ontology-based knowledge Representation - Ontology languages for the Semantic Web: Resource Description Framework - Web Ontology Language - Modeling and aggregating social network data: State-of-the-art in network data representation - Ontological representation of social individuals - Ontological representation of social relationships - Aggregating and reasoning with social network data - Advanced representations.

**Unit-3**

Extracting evolution of Web Community from a Series of Web Archive - Detecting communities in social networks - Definition of community - Evaluating communities - Methods for community detection and mining - Applications of community mining algorithms - Tools for detecting communities social network infrastructures and communities - Decentralized online social networks.

**Unit-4**

Understanding and predicting human behavior for social communities - User data management - Inference and Distribution - Enabling new human experiences - Reality mining - Context - Awareness - Privacy in online social networks - Trust in online environment - Trust models based on subjective logic - Trust network analysis.

**TEXT BOOKS:**

1. Peter Mika, Social Networks and the Semantic Web‖, First Edition, Springer 2007.
2. BorkoFurht, Handbook of Social Network Technologies and Applications, 1st Edition, Springer, 2010.

**REFERENCES**

1. GuandongXu ,Yanchun Zhang and Lin Li, Web Mining and Social Networking Techniques and applications‖, First Edition, Springer, 2011.

2. Dion Goh and Schubert Foo, Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively‖, IGI Global Snippet, 2008.

| PE-CS-AIML-420A | Neural Network and Fuzzy Logic systems | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3Hr.** |
| **Course Outcomes** | | | | | | | |
| **CO1** | To The course is designed to give a solid grounding of fundamental concepts of fuzzy logic and its applications. The level of the course is chosen to be such that all students aspiring to be a part of computational intelligence directly or indirectly in near future should get a foundation of these concepts through this course. | | | | | | |
| **CO2** | To Understanding reasoning and fuzzy logic for artificial intelligence | | | | | | |
| **CO3** | To Students will be able to learn defuzzification and fuzzy measures | | | | | | |
| **CO4** | To studentswillbeabletolearntheapplicationsoffuzzylogicandhybridsoftcomputingtechniques | | | | | | |

**Unit-I**

Neural Networks-I (Introduction & Architecture): Neuron, Nerve structure and synapse, Artificial Neuron and its model, activation functions, Neural network architecture: single layer and multilayer feed forward networks, Auto-associative and hetro-associative memory.
Neural Networks-II Back propagation network Architecture, back propagation learning methods,Applications of Artificial Neural Networks- Social Media, Marketing and Sales, Healthcare, Personal Assistants.

**Unit II**

Uncertainty in information, Fuzzy sets and membership, Chance versus ambiguity, Fuzzy set vs. Crisp set, Classical sets – operations on classical sets, Fuzzy sets – fuzzy set operations, Properties of fuzzy sets. A brief history of Fuzzy logic, Fuzzy logic vs. Crisp logic, Concept of fuzzy system, Concept of fuzzy set, Examples of fuzzy set, Some basic terminologies and notations for fuzzy sets.

**Unit III**

Fuzzy Membership Functions, Operations on Fuzzy Sets, Fuzzy Relations, Rules and Inferences, Fuzzy Relations, Crisp relations, Operations on crisp relations, Composition of two crisp relations, Operations on Fuzzy relations, Fuzzy Propositions, Fuzzy Implications, Fuzzy Inferences, Generic structure of a Fuzzy system, Defuzzification Techniques, Lambda-cut method, Weighted average method, Maxima methods, Centroid methods

**Unit IV**

Problems in some areas of applications: Medical diagnosis, Person identification / Computer vision, Handwritten character recognition, Pattern recognition and Machine Intelligence (MI), Weather forecasting, VLSI design, Network optimization, Fuzzy Systems: Fuzzy Logic Control System, Industrial applications

**References:**


1. Kliryvan- FuzzySystem&FuzzylogicPrenticeHallofIndia, FirstEdition.
2. LawrenceFussett-fundamental of Neural Network Prentice Hall, First Edition and 4th Edition
3. Bart Kosko, "NeuralnetworkandFuzzySystem"-PrenticeHall Pub.-1994.
4. Fuzzy Logic: A Practical approach, F. Martin, , Mc neill, and Ellen Thro, AP Professional, 2000.
5. Fuzzy Logic with Engineering Applications (3rd Edn.), Timothy J. Ross, Willey, 2010.
6. Foundations of Neural Networks, Fuzzy Systems, and Knowldge Engineering, Nikola K. Kasabov, MIT Press, 1998.
7. Fuzzy Logic for Embedded Systems Applications, Ahmed M. Ibrahim, Elesvier Press, 2004.Education

| PE-CS-AIML-422A | Augmented Reality | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3Hr.** |
| **Course Outcomes** | | | | | | | |
| **CO1** | The course is designed to describe how VR systems work and list the applications of VR. | | | | | | |
| **CO2** | Understand the design and implementation of the hardware that enables VR systems tobe built | | | | | | |
| **CO3** | Understand the system of human vision and its implication on perception and rendering | | | | | | |
| **CO4** | Explain the concepts of motion and tracking in VR systems and Describe the importance of interaction and audio in VR systems | | | | | | |

**Unit I**

Introduction to Augmented Reality (A.R): What Is Augmented Reality**: -** Introduction to AR, History of AR, Purpose of AR, Relation Between AR and other Technology, Application of AR, How AR work, Scope of AR, overview of AI in AR

**Unit II:**

Augmented Reality Hardware

Displays: **-** Audio Displays, Haptic Displays, Visual Displays, Other sensory displays, Visual Perception, Requirements and Characteristics.

Processors: **-** Role of Processors, Processor System Architecture, Processor Specifications.

Tracking & Sensors: **-** Tracking, Calibration, and Registration, Characteristics of Tracking Technology, Stationary Tracking Systems, Mobile Sensors, Optical Tracking, Sensor Fusion.

**Unit III:**

Computer Vision for Augmented Reality & A.R. Software

Computer Vision for Augmented Reality: **-** Marker Tracking, Multiple-Camera Infrared Tracking, Natural Feature Tracking by Detection, Simultaneous Localization and Mapping, Outdoor Tracking

Augmented Reality Software: **-** Introduction, Major Software Components for Augmented Reality Systems, Software used to Create Content for the Augmented Reality Application.

**Unit IV:**

AR Techniques- Marker based & Marker-less tracking

Marker-based approach**: -** Introduction to marker-based tracking, types of markers, marker camera pose and identification, visual tracking.

Marker types: -Template markers, 2D barcode markers, imperceptible markers.

Marker-less approach: -Localization based augmentation, real world examples.

Tracking methods: -Visual tracking, feature based tracking, hybrid tracking, and initialisation and recovery.

Text Books:

1. Virtual Reality, Steven M. LaValle, Cambridge University Press, 2016

2. Understanding Virtual Reality: Interface, Application and Design, William R Sherman and Alan B Craig, (The Morgan Kaufmann Series in Computer Graphics)". Morgan Kaufmann Publishers, San Francisco, CA, 2002

3. Developing Virtual Reality Applications: Foundations of Effective Design, Alan B Craig, William R Sherman and Jeffrey D Will, Morgan Kaufmann, 2009.

Reference Books:

1. Gerard Jounghyun Kim, "Designing Virtual Systems: The Structured Approach", 2005.

2. Doug A Bowman, Ernest Kuijff, Joseph J LaViola, Jr and Ivan Poupyrev, "3D User Interfaces, Theory and Practice", Addison Wesley, USA, 2005.

3. Oliver Bimber and Ramesh Raskar, "Spatial Augmented Reality: Meging Real and Virtual Worlds", 2005.

4. Burdea, Grigore C and Philippe Coiffet, "Virtual Reality Technology", Wiley Interscience, India, 2003.

| PE- CS- AIML-424A | Advance Machine Learning | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hr.** |
| **Course Outcomes** | | | | | | | |
| **CO1** | To understand advanced methods of machine learning. | | | | | | |
| **CO2** | To Emphasis on approaches of deep learning with practical relevance. | | | | | | |
| **CO3** | To Analyze recent applications of advanced machine learning. | | | | | | |
| **CO4** | To Understand implementation of advanced machine learning. | | | | | | |

**UNIT-I**

Binary Classification, Logistic Regression, Gradient Descent, Derivatives, Computation graph, Vectorization, Vectorizing logistic regression – Shallow neural networks: Activation functions, non-linear activation functions,

**UNIT-II**

Deep Neural Networks: Deep L-layer neural network, Forward and Backward propagation, Deep representations, Parameters vs Hyperparameters, building a Deep Neural Network (Application) – Supervised Learning with Neural Networks – Practical aspects of Deep Learning: Train/Dev / Test sets, Bias/variance, Overfitting and regularization, Linear models and optimization, Vanishing/exploding gradients, Gradient checking – Logistic Regression.

**UNIT-III**

Back-propagation: architecture, training algorithm, selection of parameters, learning application algorithm, local and global minima, merits and demerits, application. Optimization algorithms: Mini-batch gradient descent, exponentially weighted averages, RMSprop, Learning rate decay, problem of local optima, Batch norm – Parameter tuning process.

**UNIT-IV**

Convolution Neural Networks: introduction, architecture, padding, strided convolutions, pooling layers, ResNet, MobileNet, applications of CNN, Recurrent Neural Network: Expressiveness of recurrent networks, Architecture, Challenges of training Recurrent networks, Long short-term memory, Gated recurrent units, Applications of RNNs. Self-Organizing Maps, Restricted Boltzmann Machines.

**References:**


1. Deep Learning, Ian Goodfellow, YoshuaBengio and Aeron Courville, MIT Press,First Edition, 2016.
2. Deep Learning, A practitioner's approach, Adam Gibson and Josh Patterson, O'Reilly, First Edition, 2017.
3. Hands-On Learning with Scikit-Learn and Tensorflow, AurelienGeron, O'Reilly, First Edition, 2017.
4. Deep Learning with Python, Francois Chollet, Manning Publications Co, First Edition, 2018.
5. Python Machine Learning by Example, Yuxi (Hayden) Liu, First Edition, 2017.
6. A Practical Guide to Training Restricted Boltzmann Machines, Geoffrey Hinton, 2010,

| PE-CS-AIML-426A | Natural Language Processing | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3Hrs.** |
| **Purpose** | Toprovidetheunderstandingofthemathematicalandlinguisticfoundationsunderlyingapproachestothe various areas inNLP. | | | | | | |
| **Course Outcomes(CO)** | | | | | | | |
| **CO1** | Be familiar with syntax and semantics in NLP. | | | | | | |
| **CO2** | To implement various concepts of knowledge representation using Prolog. | | | | | | |
| **CO3** | To classify different parsing techniques and understand semantic networks. | | | | | | |
| **CO4** | To identify/explain various applications of NLP. | | | | | | |

**Unit-I**

Basic Concepts: concept overview, Intro to NLP, history of NLP, Applications of NLP

Key algorithms in the noisy channel paradigm. Fundamental components of Natural Language Processing: Lexicography, syntax, semantics, prosody, phonology, pragmatic analysis, world knowledge.

Knowledge Representation schemes: Semantic net, Frames, Conceptual Dependency, Scripts.

**Unit-II**

Representing knowledge using rules: Logic Programming, Introduction to LISP and Prolog, Rules based deduction systems, General concepts in knowledge acquisition.

Syntax Analysis: Formal Languages and grammars, Chomsky Hierarchy, Left- Associative Grammars, ambiguous grammars, resolution of ambiguities.

**Unit-III**

Computation Linguistics: Recognition and parsing of natural language structures- ATN and RTN, General Techniques of parsing-CKY, Earley and Tomitas algorithm. Semantics: Knowledge representation, semantics networks logic and inference pragmatics, graph models and optimization.

**Unit-IV**

Applications of NLP: Intelligent work processor, Machine translation, user interfaces, Man-Machine interfaces, natural language querying, tutoring and authoring systems, speech recognition, commercial useof NLP.

**References Books:**


1. Daniel Jurafsky, James H. Martin, “Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition”, 2nd edition, Pearson Edu., 2013.
2. James Allen, “Natural Language Understanding”, Pearson Education, Second Edition, 2003
3. Ivan Bratko, “Prolog: Programming for Artificial Intelligence”, 3rd Edition, Pearson Education, Fifth Impression 2009.
4. G. Gazder, “Natural Language processing in prolog”, Addison Wesley, 1989.

| PC-CS-AIML-406LA | Optimization Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | To Understand and implement various optimization methods in machine learning | | | | | | |
| **Course Outcomes-At the end of this course students will be able to:** | | | | | | | |
| **CO1** | Apply mathematical and computational skills needed for the practical utility operation research. | | | | | | |
| **CO2** | Implement various linear programming problems | | | | | | |
| **CO3** | Implement various optimization methods in machine learning | | | | | | |
| **CO4** | Understand and implement genetic algorithms | | | | | | |

**List of experiments:**

1. Write a python program to solve the linear problem:

**Minimize:** Z = 3x + 5y
**Subject to the constraints**:
2x + 3y >= 12
-x + y <= 3
x >= 4
y <= 3
x, y >= 0

2. Write a program in python to find the EVD (Eigen Value Decomposition) of A, where

$$A = \begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$$

3. Write a program in python to find the SVD (Singular Value Decomposition) of A, $U\Sigma V^T$, where

$$A = \begin{pmatrix} 3 & 2 & 2 \\ 2 & 3 & -2 \end{pmatrix}.$$

4. Write a program to implement Second Order Cone Program (SOCP).
5. Write a program to demonstrate KKT conditions.
6. Write a program to implement gradient Descent algorithm for finding local minima.
7. Write a program to implement Frank-Wolfe algorithm.
8. Write a program to implement Stochastic Gradient Descent Algorithm.
9. Write a program to create target string starting from random string using Genetic Algorithm.
10. Write a program to implement Particle Swarm optimization to find optimal solution.

| PC- CS-AIML-408LA | Advance AI Application Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | To Understand and implement various artificial intelligence | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | Implementation of various type of algorithm in AI applications for better use of application | | | | | | |
| **CO2** | In-depth learning of machine learning, Deep learning and neural networks | | | | | | |
| **CO3** | Implement various artificial intelligence technique | | | | | | |
| **CO4** | Understand artificial intelligence and its analytics in real world | | | | | | |

**List of Experiments:**

1. Chat bot
2. Music Recommendation App
3. Stock Prediction
4. Social Media Suggestion
5. Lane line detection while driving
6. Monitoring crop health
7. Medical diagnosis
8. AI powered Search engine
9. AI powered cleaning robots

**B. Tech Computer Science and Engineering (Artificial Intelligence and Data Science )**
**Modified Scheme of Studies/Examination (w.e.f. Session 2023-24)**
**Semester VII**

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | HM-CS-AIDS-401A | Business Intelligence and Data Visualization | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | HSS-403A | Universal Human Values II: Understanding Harmony | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | OEC | OEC Elective*-II | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PE | Elective* - I | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 |
| 5 | PE | Elective* - II | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 |
| 6 | HM-CS-AIDS-405A | Data Visualization Lab | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |
| 7 | PE-LA | Elective-I Lab | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |
| 8 | PC-CS-AIDS-409LA | Project**-I | 0:0:10 | 10 | 5 | 0 | 100 | 100 | 200 | 3 |
| 9 | PC-CS-AIDS-413A | Industrial Training*** | 0 | 0 | 3 | 0 | 100 | 0 | 100 | 0 |
| | | **Total** | | **27** | **23** | **375** | **405** | **220** | **1000** | 24 |

| Code | PE- Elective* - I | Code | PE- Elective* - II |
|---|---|---|---|
| PE-CS-AIDS-415A | ANN and Deep Learning | PE-CS-AIDS-423A | High Performance Computing |
| PE-CS-AIDS-417A | Data Mining & Predictive Modelling | PE-CS-AIDS-425A | Human AI Interaction |
| PE-CS-AIDS-419A | Predictive Analysis | PE-CS-AIDS-427A | Software Testing |
| PE-CS-AIDS-421A | Advance Computer Architecture | PE-CS-AIDS-429A | Natural Language Processing |

| Code | OEC Elective*-II | Code | PE-LA-Elective*-I Lab |
|---|---|---|---|
| OE-CS-AIDS-401 | Cyber Law and Ethics | PE-CS-AIDS-415LA | ANN and Deep Learning Lab |
| OE-CS-AIDS-403 | Probability for Data Science | PE-CS-AIDS-417LA | Data Mining & Predictive Modelling Lab |
| OE-CS-AIDS-405 | Cluster Computing | PE-CS-AIDS-419LA | Predictive Analysis Lab |
| OE-CS-AIDS-407 | Microprocessor | PE-CS-AIDS-421LA | Advance Computer Architecture Lab |

**Note:**

***The students will choose any two departmental Electives courses and One Open Elective course out of the given elective list in VII Semester.**

****Project should be initiated in the beginning of 7$^{th}$semester, and should be completed bythe end of 7$^{th}$semester with good Report and power-point Presentation etc.**

*****4-6 weeks hand on training completed after 6$^{th}$ Semester Exams**

| HM-CS-AIDS-401A | Business Intelligence and Data Visualization | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | This course introduces basic BI technologies. BI With data mining, it is possible to better manage product warranties, predict purchases of retail stock, unearth fraud, determine credit risk, and define new products and services. | | | | | | |
| **CourseOutcomes** | | | | | | | |
| **CO1** | Students will learn the principles and best practices for how to use data in order to support fact-based decision making. | | | | | | |
| **CO2** | Emphasis will be given to applications in marketing, where BI helps in the Businesses. | | | | | | |
| **CO3** | BI helps performing for sales analysis and in application domains | | | | | | |
| **CO4** | Practical experience will be gained by developing a BI project (case-study) with leading BI software. | | | | | | |

**Unit-I**

**An Overview of Business Intelligence:** Analytics and Decision Support A Framework for Business Intelligence (BI). Intelligence Creation Use and BI Governance. Transaction Processing Versus Analytic Processing. Successful BI Implementation. Analytics Overview. Brief introduction to Big Data Analytics.

**Unit-II**

**Data Warehousing:** Data Warehousing Process Overview. Data Warehousing Architectures. Data Integration and the Extraction, Transformation, and Load Processes. Data Warehouse Development. Data Warehousing Implementation Issues. Real-Time Data Warehousing. Data Warehouse Administration, Security Issues and Future Trends

**Unit-III**

**Big Data and Analytics:** Definition of Big Data. Fundamentals of Big Data Analytics. Big Data Technologies. Data Scientist. Big Data and Data Warehousing. Big Data Vendors. Big Data and Stream Analytics. Applications of Stream Analytics

**Unit-IV**

**Data Visualization:** Business Reporting, Visual Analytics and Business Performance Management Business Reporting Definitions and Concepts. Data and Information Visualization. Different Types of Charts and Graphs. The Emergence of Data Visualization and Visual Analytics. Performance Dashboards. Business Performance Management. Performance Measurement. Balanced Scorecards. Six Sigma as a Performance Measurement

System

**Suggested Books**:

The Visual Display of Quantitative Information by Edward R. Tufte
Business Intelligence: Making Better Decisions Faster by Elizabeth Vitt , Michael Luckevich, Stacia Misner
Business Intelligence Competency Centers: A Team Approach to Maximizing Competitive Advantage (Hardcover)by Gloria J. Miller

| **HSS-403A** | **Universal Human Values II: Understanding Harmony** | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **MajorTest** | **MinorTest** | **Total** | **Time** |
| **3** | **0** | **0** | **3.0** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | Purposeandmotivationforthecourse,recapitulationfromUniversalHumanValues-I | | | | | | |
| **CourseOutcomes(CO)** | | | | | | | |
| **CO1** | Developmentofaholisticperspectivebasedonself-explorationabout | | | | | | |
| **CO2** | Understanding(ordevelopingclarity)oftheharmonyinthehumanbeing,family,soci etyand nature/existence. | | | | | | |
| **CO3** | Strengtheningofself-reflection. | | | | | | |
| **CO4** | Developmentofcommitmentandcouragetoact. | | | | | | |

**Module1:CourseIntroduction-Need,BasicGuidelines, ContentandProcessforValueEducation**

1. PurposeandmotivationforthecourseRecapitulationfromUniversalHumanValues-I
2. Self-Exploration–what is it? - Its contentand process;'Natural Acceptance' andExperiential Validation-as the process forself-exploration
3. ContinuousHappinessandProsperity- AlookatbasicHumanAspirations
4. Rightunderstanding,RelationshipandPhysicalFacility- thebasicrequirementsforfulfilmentofaspirationsofeveryhumanbeingwiththeircorrectpriority
5. UnderstandingHappinessandProsperitycorrectly-Acriticalappraisalofthecurrentscenario
6. Methodtofulfiltheabovehumanaspirations:understandingandlivinginharmonyatvariouslevels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance forlivingwithresponsibility(livinginrelationship,harmonyandco-existence)ratherthanasarbitrarinessinchoicebasedonliking-disliking

**Module2:UnderstandingHarmonyintheHumanBeing-HarmonyinMyself!**

1. Understandinghumanbeingasaco-existenceofthesentient'I'andthematerial'Body'
2. UnderstandingtheneedsofSelf('I') and 'Body'-happinessandphysicalfacility
3. UnderstandingtheBodyasaninstrumentof'I'(Ibeingthedoer,seer andenjoyer)
4. Understandingthecharacteristicsandactivitiesof'I'andharmonyin'I'
5. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs,meaningofProsperityindetail
6. Programstoensure SanyamandHealth.

Include practice sessions to discuss the role others have played in making material goods available tome. Identifying from one's own life. Differentiate between prosperity and accumulation. Discussprogramforensuringhealthvs dealingwithdisease

**Module 3: Understanding Harmony in the Family and Society- Harmony in Human-HumanRelationship**

1. Understanding values in human-human relationship; meaning of Justice (nine universal values inrelationships)andprogramforitsfulfilmenttoensuremutualhappiness;TrustandRespectasthe foundationalvaluesofrelationship
2. UnderstandingthemeaningofTrust;Differencebetweenintentionandcompetence
3. Understanding the meaning of Respect, Difference between respect and differentiation; the othersalientvaluesinrelationship
4. Understanding theharmony inthesociety(societybeinganextensionoffamily): Resolution,Prosperity,fearlessness(trust)and co-existence ascomprehensive Human Goals

5. Visualizing a universal harmonious order in society- Undivided Society, Universal Order-fromfamilytoworldfamily.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family,reallifeexamples,teacher-studentrelationship,goalofeducationetc.Gratitudeasauniversalvalueinrelationships.Discuss withscenarios.Elicitexamplesfromstudents'lives

**Module4:UnderstandingHarmonyintheNatureandExistence-WholeexistenceasCoexistence**

1. Understandingtheharmony intheNature
2. Interconnectednessandmutual fulfillment amongthefourordersofnature-recyclabilityandself-regulationinnature
3. UnderstandingExistenceasCo-existenceof mutuallyinteractingunitsinall-pervasivespace
4. Holisticperceptionofharmonyatalllevels ofexistence.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" canbeused),pollution,depletionofresourcesandroleoftechnologyetc.

**Module5: ImplicationsoftheaboveHolisticUnderstandingofHarmonyonProfessionalEthics**

1. Naturalacceptance ofhumanvalues
2. Definitiveness ofEthicalHumanConduct
3. BasisforHumanisticEducation,HumanisticConstitutionandHumanisticUniversalOrder
4. Competenceinprofessionalethics a. Abilitytoutilizetheprofessionalcompetenceforaugmenting universal human order b. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems, c. Ability toidentify and develop appropriatetechnologiesandmanagementpatternsforaboveproductionsystems.
5. Casestudiesoftypicalholistictechnologies,managementmodelsandproductionsystems
6. Strategy for transition from the presentstate to Universal Human Order: a.At the level ofindividual: as socially and ecologically responsible engineers, technologists and managers b. Atthelevelofsociety:asmutuallyenrichinginstitutionsandorganizations
7. Sumup.

IncludepracticeExercisesandCaseStudies will be takenupinPractice(tutorial)Sessionseg.todiscusstheconductas anengineerorscientistetc.

**READINGS:**

**TextBook**

1. HumanValuesand ProfessionalEthicsbyRRGaur,RSangal,GP Bagaria,ExcelBooks,New Delhi,2010

**ReferenceBooks**


1. JeevanVidya:EkParichaya, ANagaraj, JeevanVidyaPrakashan, Amarkantak,1999.
2. HumanValues,A.N.Tripathi,NewAgeIntl.Publishers,NewDelhi,2004.
3. TheStoryofStuff(Book).
4. TheStoryofMyExperimentswithTruth-byMohandas KaramchandGandhi
5. SmallisBeautiful-E.FSchumacher.
6. SlowisBeautiful-CecileAndrews
7. EconomyofPermanence-JCKumarappa
8. BharatMeinAngrejiRaj-PanditSunderlal
9. RediscoveringIndia –byDharampal
10. HindSwarajorIndianHomeRule-byMohandasK.Gandhi
11. IndiaWinsFreedom-MaulanaAbdulKalamAzad
12. Vivekananda-RomainRolland(English)
13. Gandhi-RomainRolland(English)


**MODEOFCONDUCT**

Lecture hours are to be used for lecture/practice sessions.

Lectureshoursaretobeusedforinteractivediscussion, placingtheproposalsaboutthetopicsathandandmotivatingstudents toreflect,explore andverifythem.

Practicehoursaretobeusedforpracticesessions.

While analyzing anddiscussingthetopic,thefacultymentor'sroleisinpointingtoessentialelementsto help in sorting them out from the surface elements. In other words, help the students explore theimportantorcriticalelements.

In the discussions, particularly during practice sessions, the mentor encourages the studentto connect with one's own self and do self-observation, self-reflection and self-exploration. Scenariosmay be used to initiate discussion. The student is encouraged to take up" ordinary" situations ratherthan" extra-ordinary"situations. Such observations and their analyses are shared and discussed withotherstudents andfacultymentor,inagroupsitting.

Practice experiments are important for the course. The difference is that the laboratoryis everyday life, and practical are how you behave and work in real life. Depending on the nature oftopics, worksheets, home assignment and/or activity are included. The practice sessionswould also provide support to a student in performing actions commensurate to his/her beliefs. It isintendedthatthiswouldleadtodevelopmentofcommitment,namelybehavingandworkingbasedonbasichuman values.

It is recommended that this content be placed before the student as it is, in the form of a basicfoundation course, without including anything else or excluding any part of this content. Additionalcontentmaybe offeredinseparate,highercourses.

Thiscourseistobetaughtbyfacultyfromeveryteachingdepartment,includingHSSfaculty.Teacherpreparationwithaminimumexposuretoatleastone8-dayFDPonUniversalHumanValuesisdeemedessential.

**ASSESSMENT:**

This is a compulsory credit course. The assessment is to provide a fair state of development of thestudent, so participation in classroom discussions, self-assessment, peer assessment etc. will be usedinevaluation.

Example:
Assessmentby
Facultymentor:5 marks
Self-assessment:5 marks
Assessmentbypeers:5 marks
Sociallyrelevantproject/GroupActivities/Assignments:10 marks
SemesterEndExamination: 75marks
Theoverallpasspercentageis40%. Incasethestudentfails,he/shemustrepeatthecourse.

| **S. No.** | **Course No.** | **Subject** | **L:T:P** | **Hours/ Week** | **Credits** | **Examination Schedule** | | | | **Duration of Exam (Hrs.)** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Major Test** | **Minor Test** | **Practical** | **Total** | |
| 1 | OEC | **OEC Elective-II** | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |

| OE-CS-AIDS-401 | Cyber Law and Ethics | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | To gain a broad understanding in order to get cyber law and ethics. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | To facilitate the basic knowledge of cyber Law. | | | | | | |
| **CO 2** | To learn about how to maintain the Confidentiality, Integrity and Availability of information technology act. | | | | | | |
| **CO 3** | To get enable to fix the various Cyber Law and Related Legislation. | | | | | | |
| **CO 4** | To deal with the Cyber Ethics. | | | | | | |

**Unit-1: Introduction to Cyber Law**

Evolution of computer technology, emergence of cyber space. Cyber Jurisprudence, Jurisprudence and law, Doctrinal approach, Consensual approach, Real Approach, Cyber Ethics, Cyber Jurisdiction, Hierarchy of courts, Civil and criminal jurisdictions, Cyberspace-Web space, Web hosting and web Development agreement, Legal and Technological Significance of domain Names, Internet as a tool for global access.

**Unit-2: Information Technology Act**

Overview of IT Act, 2000, Amendments and Limitations of IT Act, Digital Signatures, Cryptographic Algorithm, Public Cryptography, Private Cryptography, Electronic Governance, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature, Certifying Authorities, Cyber Crime and Offences, Network Service Providers Liability, Cyber Regulations Appellate Tribunal, Penalties and Adjudication.

**Unit-3: Cyber Law and Related Legislation**

Patent Law, Trademark Law, Copyright, Software – Copyright or Patented, Domain Names and Copyright disputes, Electronic Data Base and its Protection, IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code, Relevant Sections of Indian Evidence Act, Relevant Sections of Bankers Book Evidence Act, Relevant Sections of Indian Penal Code, Relevant Sections of Reserve Bank of India Act, Law Relating To Employees And Internet, Alternative Dispute Resolution , Online Dispute Resolution (ODR).

**Unit-4: Cyber Ethics**

The Importance of Cyber Law, Significance of cyber Ethics, Need for Cyber regulations and Ethics. Ethics in Information society, Introduction to Artificial Intelligence Ethics: Ethical Issues in AI and core Principles, Introduction to Block chain Ethics.

**Suggested Books:**

1. Cyber Security : Understanding Cyber Crimes , Computer Forensics and Legal Perspectives By Nina Godbole, Sunit Belapur , Wiley
2. Understanding cybercrime: phenomena , and legal challenges response, ITU 2012.

| OE-CS-AIDS-403 | Probability for Data Science | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To understand the foundations of probability and its relationship to statistics and data science. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Understand the mathematical framework for probability theory | | | | | | |
| **CO2** | Understand various kinds of Random Variables that are fundamental to probabilistic modeling. | | | | | | |
| **CO3** | To Learn Statistical Concept in Data Analytics | | | | | | |
| **CO4** | Explore some introductory concepts from statistics that are helpful in analyzing data and machine learning. | | | | | | |

**Unit I**

Probability Theory: Counting, combinations, permutations, binomial and multinomial coefficients,Stirling's formula. Discrete probability spaces (with examples). Axiomatic definition of probability, inclusion-exclusion formula, independence, condition probability, Bayes' rule.

**Unit II**

Random variables: definition, distribution function and its properties, probability mass function (binomial, Bernoulli, Poisson, geometric), probability density function (uniform, exponential, Gaussian).Joint distributions, independence and conditioning of random variables. Function of random variables, change of variable formula.

**Unit III**

Measures of central tendency, dispersion and association – expectation, median, variance, standard deviation, mean absolute deviation, covariance, correlation and entropy (definitionand guidelines on how to choose a particular measure). Markov and Chebyshev inequalities, Notion of convergence in probability and distribution. Weak law of large numbers andcentral limit theorem (examples demonstrating the use of WLLN and CLT). Montecarlo methods (estimating value of e, π, simulation of birthday paradox). Poisson limit for rare events.

**Unit IV**

Statistics: Using probability to understand data (give real life examples). Frequentist approach - point and range estimates, confidence intervals, hypothesis testing p-values, significance level, power and t-test. Bayesian inference–maximum likelihood estimation. Regression

**Textbooks:**

Sheldon Ross, Introduction to Probability and Statistics for Engineers, 5/e (2014), Elsevier
Reference Books:
Morris H. DeGroot and Mark J. Schervish, Probability and Statistics (4/e)(2012), Addison-Wesley.
Blitzstein and Hwang, Introduction to Probability (2015), CRC Press.
William Feller, An Introduction to Probability, (3/e) (2008), Volume 1, Wiley.
Freedman, Pisani, Purves, Statistics (4/e)(2014), W. W. Norton & Company

| OE-CS-AIDS-405 | Cluster Computing | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | The objective is to learn emerging techniques in Cluster Computing and its applications. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Remember and understand the basic concepts/Principles of distributed Systems | | | | | | |
| **CO2** | Analyze the Various Concepts of Cluster Computing | | | | | | |
| **CO3** | Able to describe different parallel processing platforms involved in achieving high performance computing | | | | | | |
| **CO4** | Develop efficient and high-performance parallel programming. | | | | | | |

**UNITI**

BasicconceptsinDistributedSystems:Notion of time Distributed Mutual exclusion, Consensus, Failure models Paradigms for process interaction in distributed programs, Programming Paradigms, Shared memory, Message passing, Workflows.

**UNITII**

Introduction to Cluster Computing, Cluster Middleware, Early Cluster Architecture and High Throughput Computing Clusters, Networking, Protocols and I/O for Clusters, Setting Up and Administering aCluster , Overview of Cluster Computing, Cluster Computer and its Architecture, Clusters Classifications, Components for Clusters, Cluster Middleware and Single System Image.

**UNITIII**

Cluster Technology for High Availability, Performance Models and Simulation, Process Scheduling, Resource Management and Scheduling, Programming, EnvironmentsandTools, LoadSharing and Load Balancing, Distributed Shared Memory, Cluster Applications, Cluster Systems.

**UNITIV**

Beowulf Cluster: The Beowulf Model, Application Domains, Beowulf System Architecture, SoftwarePractices, Parallel Programming withMPL, Parallel Virtual Machine(PVM). System Infrastructure, Traditional paradigms for distributed computing, Web Services, Grid standards:OGSAandWSRF,Case Studies ofCluster Systems: COMPaS,NanOS and PARAM

**TEXTBOOKS:**

Rajkumar Buyya High Performance Cluster Computing: Architectures and Systems. Prentice-Hall India, 1999.

HighPerformanceClusterComputing:Architecturesand Systems, Vol.1, Prentice Hall
GridandCluster Computing, PrabhuC.S.R,PHILearningPrivateLimited
In search of clusters(2nded.),GregoryF.Pfister,IBM,Austin,TX,Prentice-Hall
DistributedandCloudComputing,FirstEdition,GeoffreyC.Fox,KaiHwang,JackJ.Dongarra ,ElsevierIndia Pvt. Ltd.-NewDelhi
Laurence T.Yang, Minyi Guo – High Performance Computing Paradigm and Infrastructure JohnWiley

| OE-CS- AIDS-407 | Microprocessor | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | 3 | 75 | 25 | 100 | **3Hour** |
| **Purpose** | Tolearnthearchitectureandprogrammingof Intelfamily microprocessors anditsinterfacing. | | | | | | |
| **CourseOutcomes** | | | | | | | |
| **CO1** | TostudytheArchitectureof8086microprocessors | | | | | | |
| **CO2** | Toimplement theinterfacingofmemories to8086Microprocessor | | | | | | |
| **CO3** | Tolearnandanalyzetheinstructionsetof8086Microprocessorandimplementationof assemblylanguageprogrammingof8086Microprocessor. | | | | | | |
| **CO4** | Todesignandimplementtheinterfacingof interrupts,basicI/OandDMAwith8086Microprocessor | | | | | | |

**UnitI**

8086 CPU ARCHITECTURE: 8086 Block diagram; description of data registers, address registers; pointerand index registers, PSW, Queue, BIU and EU. 8086 Pin diagram descriptions. Generating 8086 CLK and reset signals using 8284. WAIT state generation. Microprocessor BUS types and buffering techniques, 8086minimummodeandmaximummodeCPUmodule.

**UNIT-II**

Main Memory System Design: Memory devices, 8086 CPU Read/Write timing diagrams in minimum modeand maximum mode. Address decoding techniques. Interfacing SRAMS; ROMS/PROMS. Interfacing andrefreshingDRAMS.

**UNIT-III**

8086 Instruction Set: Instruction formats, addressing modes, Data transfer instructions, string instructions,logical instructions, arithmetic instructions, transfer of control instructions; process control instructions;Assemblerdirectives.

8086 Programming Techniques: Writing assembly Language programs for logical processing, arithmeticprocessing,timingdelays;loops,data conversions.

**UNIT-IV**

Basic I/O Interface: Parallel and Serial I/O Port design and address decoding. Memory mapped I/O VsIsolated I/O Intel's 8255 and 8251- description and interfacing with 8086.ADCs and DACs, - types,operation and interfacing with 8086. Interfacing Keyboards, alphanumeric displays, multiplexed displays,andsteppermotor,opticalencoderwith8086.

Interrupts and DMA: 8086 Interrupt mechanism; interrupt types and interrupt vector table. Applications ofinterrupts,Intel's8259.DMAoperation.Intel's8237.

**SuggestedBooks:**

BarryB.Brey,“TheIntelMicroprocessor8086/8088,80186”,PearsonEducation,EighthEdition,2009
D.V.Hall,MicroprocessorsandInterfacing,McGrawHill2nded.
Liu, Gibson, “MicrocomputerSystems:The8086/88Family”, 2nd Edition, PHI,2005
KennethAyala,“The8086Microprocessor:Programming&InterfacingthePC”,CengageLearning,
IndianEdition, 2008
KipIrvine,”AssemblylanguageforIBM PC”,PHI,2nd Edition,1993
PeterAbel, ”Assemblylanguageprogramming”, PearsonEdu,5th Edition,2002
Uffenback, “The8086FamilyDesign”PHI, 2nd Edition.
WalterATriebelandAvtarSingh; The8088 and8086Microprocessors

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | **PE** | **Elective - I** | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 |

| Code | PE- Elective - I |
|---|---|
| PE-CS-AIDS-415A | ANN and Deep Learning |
| PE-CS-AIDS-417A | Data Mining & Predictive Modelling |
| PE-CS-AIDS-419A | Predictive Analysis |
| PE-CS-AIDS-421A | Advance Computer Architecture |

| PE-CS-AIDS-415A | ANN and Deep Learning | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| 2 | 0 | 0 | 2 | 75 | 25 | 100 | 3 hrs |
| **Purpose** | Purpose To provide knowledge of various artificial neural networks and deep learning algorithms for optimization | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| CO 1 | To learn the basics of artificial neural networks concepts, various neural networks architecture | | | | | | |
| CO 2 | To explore knowledge of special types of Artificial neural networks | | | | | | |
| CO 3 | To understand the basics of Deep learning and its applications | | | | | | |
| CO 4 | To imprise about the different deep learning algorithms and their applications to solve real world problems. | | | | | | |

**UNIT-I**

Artificial Neural Networks: Human brain, Model of an artificial neuron, Basic concepts of neural networks, fundamentals of biological neural network and artificial neural network, evolution of neural networks, Characteristics of Neural Networks, learning methods-supervised, unsupervised and reinforcement, taxonomy of neural network architectures, terminologies-weights, bias, threshold, learning rate, applications of Neural Networks.

**Unit-II**

Supervised and Unsupervised Neural Networks: Training Neural Network: Risk minimization, loss function, backpropagation, regularization, model selection, and optimization.Hebb network theory and training algorithm, perceptron networks architecture and training algorithms, Back Propagation networks architecture and Training Algorithms, Associative Memory network architecture and Training Algorithms, Hopfield networks architecture and Training Algorithms, Counter Propagation networks architecture and Training Algorithms, adaptive resonance theory networks architecture and Training Algorithms. Probabilistic Neural Network: Hopfield Net, Boltzman machine, RBMs, Sigmoid net, Autoencoders

**Unit-III**

Advanced neural networks: Kohonan self organising feature, maps architecture and training algorithm, learning vector quantization architecture and training algorithm, boltzman machine, cognitron network, neocognitron network, optical neural networks electro-optical multipliers and holographic correlators. Conditional Random Fields: Linear chain, partition function, Markov network, Belief propagation, Training CRFs, Hidden Markov Model, Entropy.

**Unit-IV**

Deep learning: Various paradigms of learning problems, Perspectives and Issues in deep learning framework, review of fundamental learning techniques. Deep Learning research: Object recognition, sparse coding, computer vision, natural language processing Machine learning basics, simple machine learning algorithms-linear regression,underfitting and overfitting challenges in machine learning, supervised learning approach for support vector machine, Deep Forward Networks, Convolutional networks, deep recurrent networks, deep boltzmann machine, applications in speech recognition and natural language processing. Deep Feed Forward network, regularizations, and training deep models, Deep Belief Network..Deep Learning Tools: Caffe, Theano, Torch.

**Suggested Books:**

Li Min Fu, “Neural Networks in Computer Intelligence”, McGraw-Hill, Inc. 2012.
S N Sivanandam, “Neural Networks using MATLAB 6.0”, TMH, 4 th . Reprint 2015.
S N Sivanandam, “Principles of Soft Computing”, 2 nd . Edition, Wiley, Reprint 2014.
Freeman J.A. & D.M. Skapura, “Neural Networks: Algorithms, Applications and Programming Techniques”, Addison Wesley, Reading, Mass, 2014.
Deep Learning (Ian J. Goodfellow, YoshuaBengio and Aaron Courville), MIT Press, 2016.
Deep Learning with Python: A Hands-On Introduction by Ketkar, Apress
T2. Bishop, C. ,M., Pattern Recognition and Machine Learning, Springer, 2006.

| PE-CS-AIDS-417A | Data Mining & Predictive Modelling | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | The objective of this course is to provide the in- depth coverage of data mining and modelling aspects along with its implementation | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO 1** | Understand the fundamental concept of Data Mining. | | | | | | |
| **CO 2** | Learn Data Mining techniques for Prediction and Forecasting. | | | | | | |
| **CO 3** | Compare the underlying Predictive Modelling techniques. | | | | | | |
| **CO 4** | Select appropriate Predictive Modelling approaches to identify cases and apply using a suitable package such as SPSS modeler . | | | | | | |

**Unit-I:**

Introduction to Data Mining,concepts of Data mining, Technologiesused,Data Mining Process,KDD process models,Mining on various kinds of data,Classification of Data Mining Systems, Application of Data Mining and challenges of Data Mining.

**Unit-II:**

Data Mining Techniques: Statistical Perspective on Data Mining, Similarity Measures, Clustering- Requirement for Cluster Analysis, Clustering Methods, Decision Tree- Decision Tree Induction, Attribute Selection Measures, Tree Pruning. Association Rule Mining: Frequent Item-set Mining using Apriori Algorithm, Nearest Neighbour Classification: Performance of Nearest Neighbour Classifiers.

**Unit-III:**

Model development & techniques Data Partitioning, Model selection, Model Development Techniques, Neural networks, Decision trees, Logistic regression, Discriminant analysis, Support vector machine, Bayesian Networks, Linear Regression, Cox Regression, Association rules.

**Unit-IV:**

Model Evaluation and Deployment Introduction, Model Validation, Rule Induction Using CHAID, Automating Models for Categorical and Continuous targets, Comparing and Combining Models, Evaluation Charts for Model Comparison, MetaLevel Modeling, Deploying Model, Assessing Model Performance, Updating a Model.

**Text books:**

J Hanes, M. Kamber, Data Mining Concepts and Techniques, Elsevier India.
Predictive & Advanced Analytics (IBM ICE Publication)
G.S. Linoff, M.J.A. Berry, Data Mining Techniques, Wiley India Pvt. Ltd.
Berson, S.J. Smith, Data Warehousing, Data Mining & OLAP, Tata McGraw-Hill

| PE-CS-AIDS-419A | Predictive Analysis | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | Predictive analytics is emerging as a competitive strategy across many business sectors and can set apart high performing companies. It aims to predict the probability of the occurrence of a future event such as customer churn, loan defaults, and stock market fluctuations leading to effective business management. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | Understand how to use predictive analytics tools to analyze real-life business problems. | | | | | | |
| **CO2** | Demonstrate case-based practical problems using predictive analytics techniques to interpret model outputs. | | | | | | |
| **CO 3** | Learn regression, logistic regression, and forecasting using software tools such as MS Excel, SPSS, and SAS. | | | | | | |
| **CO4** | Understand to Forecasting,Time Series Analysis and develop the Model. | | | | | | |

**Unit-I**

**Introduction to Analytics:**Analytics in Decision Making, DescriptiveAnalytics, ProbabilityDistribution, HypothesisTesting, Analysis of Variance, Game changers &Innovators, Predictive Analytics.

**Unit-II**

**Simple Linear Regression (SLR):** Introduction to Regression, ModelDevelopment, ModelValidation, Multiple Linear Regression, Estimation of Regression Parameters, ModelDiagnostics, Dummy, Derived & Interaction Variables,Multi-collinearity,Model Deployment.

**Unit-III**

**Logistic Regression:** Discrete choice models, LogisticRegression Estimation of Parameters, Logistic Model Interpretation, Logistic Model Diagnostics, Logistic Model Deployment, Decision Trees and Unstructured data analysis,Chi-Square Automatic Interaction Detectors (CHAID),Classification and Regression Tree (CART),Analysis of Unstructured data, Naive Bayes algorithm.

**Unit-IV**

**Forecasting and Time series Analysis:**Forecasting,Time Series Analysis,Additive& Multiplicative models,Exponential smoothing techniques,ForecastingAccuracy,Auto regressive and Moving average models, Case Study on Forecasting.

**Suggested Books**:

**C.M.Bishop –Pattern Recognition and Machine Learning,Springer,2006**

**L.Wasserman-All of statistics**

| PE-CS-AIDS-421A | Advance Computer Architecture | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To enable students to learn various computational models, design paradigms of advanced computer architecture, parallelism approaches and techniques for static and dynamic interconnections. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Classify and interpret various paradigms, models and micro-architectural design of advanced computer architecture as well as identify the parallel processing types and levels for achieving optimum scheduling | | | | | | |
| **CO2** | Identify the roles of VLIW & superscalar processors and branch handling techniques for performance improvement | | | | | | |
| **CO3** | Analyze and interpret the basic usage of various MIMD architectures and relative importance of various types of static and dynamic connection networks for realizing efficient networks. | | | | | | |
| **CO4** | Examine the various types of processors and memory hierarchy levels and cache coherence problem including software and hardware based protocols to achieve better speed and uniformity. | | | | | | |

**Unit-I**

Computational Model: Basic computational models, evolution and interpretation of computer architecture, concept of computer architecture as a multilevel hierarchical framework, classification of parallel architectures, Relationships between programming languages and parallel architectures. Parallel Processing: Types and levels of parallelism, Instruction Level Parallel (ILP) processors, dependencies between instructions, principle and general structure of pipelines, performance measures of pipeline, pipelined processing of integer, Boolean, load and store instructions, VLIW architecture, Code Scheduling for ILP Processors - Basic block scheduling, loop scheduling, global scheduling.

**Unit-II**

Superscalar Processors: Emergence of superscalar processors, Tasks of superscalar processing – parallel decoding, superscalar instruction issue, shelving, register renaming, parallel execution, preserving sequential consistency of instruction execution and exception processing, comparison of VLIW & superscalar processors. Branch Handling: Branch problem, Approaches to branch handling – delayed branching, branch detection and prediction schemes, branch penalties, multiway branches, guarded execution.

**Unit-III**

MIMD Architectures: Concepts of distributed and shared memory MIMD architectures, UMA, NUMA, CCNUMA & COMA models, problems of scalable computers. Static

connection networks: Linear array, ring, chordal ring, barrel shifter, star, tree, mesh and torus, fat Tree, systolic array, barrel shifter, hypercubes and Cube connected cycles. Dynamic interconnection networks: single shared buses, comparison of bandwidths of locked, pended & split transaction buses, arbiter logics, crossbar networks, multistage networks, omega networks, butterfly.

**UNIT – IV**

Processors and Memory Hierarchy: Advanced processor technology, memory hierarchy technology and virtual memory technology. Cache Coherence and Synchronization Mechanisms: Cache coherence problems, hardware based protocols – snoopy cache protocols, directory schemes, hierarchical cache coherence protocols, software based protocols.

**Reference Books:**

D.Sima, T.Fountain, P.Kasuk, Advanced Computer Architecture-A Design Space Approach, Pearson Education.

Kai Hwang and Naresh Jotwani, Advanced Computer Architecture-Parallelism, Scalability, Programmability, McGraw Hill.

M.J. Quinn, Parallel Computing: Theory and Practice, Second Edition, McGraw Hill.

J. L. Hennessy and D. A. Patterson, Computer Architecture: A Quantitative approach, Morgan Kaufmann/Elsevier.

T.G. Lewis and H. EI- Rewini, Introduction to parallel computing, Prentice Hall.

Nicolas Carter, Computer Architecture, McGraw Hill.

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Major Test** | **Minor Test** | **Practical** | **Total** | |
| 1 | PE | **Elective - II** | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 |

| **Code** | **PE- Elective - II** |
|---|---|
| PE-CS-AIDS-423A | High Performance Computing |
| PE-CS-AIDS-425A | Human AI Interaction |
| PE-CS-AIDS-427A | Software Testing |
| PE-CS-AIDS-429A | Natural Language Processing |

**Unit-1**

| **PE-CS-AIDS-423A** | **High Performance Computing** | | | | | | |
|---|---|---|---|---|---|---|---|
| L | Tutorial | Practical | Credit | Major Test | Minor Test | Total | Time |
| 2 | 0 | 0 | 2 | 75 | 25 | 100 | 3 hrs |
| **Purpose** | The design of high-performance computing (HPC) systems for compelling vision for how computation can seamlessly scale from a single processor to virtually limitless computing power | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | To study the need for HPC and parallelism | | | | | | |
| **CO 2** | To study parallel models of computation such as dataflow, and demand-driven computation. | | | | | | |
| **CO 3** | To study state of the art processor architectures | | | | | | |
| **CO 4** | To program and accelerate applications on the new high performance computing devices, we must understand both the computational architecture and the principles of program optimization | | | | | | |

Parallel Processing Concepts; Levels and model of parallelism: instruction, transaction, task, thread, memory, function, data flow models, demand-driven computation. Levels of parallelism (instruction, transaction, task, thread, memory, function), Models (SIMD, MIMD, SIMT, SPMD, Dataflow Models, Demand-driven Computation etc), Parallel architectures: N-wide superscalar architectures, multi-core, multi-threaded, server and cloud.

**Unit-2**

Parallel Programming with CUDA, Processor Architecture, Interconnect, Communication, Memory Organization, and Programming Models in high performance computing architectures: (Examples: IBM CELL BE, Nvidia Tesla GPU, Intel Larrabee Microarchitecture and Intel Nehalem microarchitecture), Memory hierarchy and transaction

specific memory design, Thread Organization. Fundamental design issues in HPC: Load balancing, scheduling, synchronization and resource management; Operating systems for scalable HPC; Parallel languages and programming environments; OpenMP, Pthread, MPI, java, Cilk

**Unit-3**

Fundamental Design Issues in Parallel Computing: Synchronization, Scheduling, Job Allocation, Job Partitioning, Dependency Analysis, Mapping Parallel Algorithms onto Parallel Architectures, and Performance Analysis of Parallel Algorithms. Scalable storage systems: RAID, SSD cache, SAS, SAN; HPC based on cluster, cloud, and grid computing: economic model, infrastructure, platform, computation as service; Accelerated HPC: architecture, programming and typical accelerated system with GPU, FPGA, Xeon Phi, Cell BE; Power-aware HPC Design: computing and communication, processing, memory design, interconnect design, power management.

**Unit-4**

Performance analysis of parallel algorithms, Fundamental Limitations Facing Parallel Computing, Fundamental limitations in HPC: bandwidth, latency and latency hiding techniques, Tolerating Techniques and their limitations, Benchmarking HPC: scientific, engineering, commercial applications and workloads, Power-Aware Computing and Communication, Power-aware Processing Techniques, Power-aware Memory Design, Power-aware Interconnect Design, Software Power Management. Advanced Topics: Petascale Computing, Optics in Parallel Computing, Quantum Computers, Recent developments in Nanotechnology and its impact on HPC

**Suggested Books:**

Georg Hager and Gerhard Wellein. Introduction to High Performance Computing for Scientists and Engineers (1st ed.). CRC Press, Chapman & Hall/CRC Computational Science, India, 2010.

Vipin Kumar , Ananth Grama , Anshul Gupta , George Karypis. Introduction to Parallel Computing (2nd ed.). Pearson India . 2003.

John L. Hennessy and David A. Patterson. Computer Architecture: A Quantitative Approach (5th ed.). Elsevier India Pvt. Ltd. 2011.

David B. Kirk and Wen-mei W. Hwu. Programming Massively Parallel Processors: A Hands-On Approach (1st ed.). Elsevier India Pvt. Ltd. 2010.

Michael T. Heath. Scientific Computing: An Introductory Survey (2nd ed.). McGraw Hill Education (India) Private Limited, 2011

| PE-CS-AIDS-425A | Human AI Interaction | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | This course concerns critical and responsible design, development and evaluation of AI technologies with a focus on human-AI-interaction. The aim of this module is to provide students with a cross-disciplinary background and the advanced skills of utilizing and critically evaluating the impact of Human-AI concepts and technologies within their ecosystems. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To have a broad foundational understanding of types and techniques in AI/ML | | | | | | |
| **CO2** | To be able to demonstrate good understanding of the potential use cases and benefits of artificial intelligence (AI) technologies | | | | | | |
| **CO3** | To have a critical understanding of the ethical, social and legal implications of AI applications on human life and work | | | | | | |
| **CO4** | To be able to understand appropriate design, development and research methods for human-AI interaction | | | | | | |

**Unit 1**

Introduction to advanced automation, Introduction to Human-AI Interaction, Human Needs, Perceptions, and Experiences of Using AI, personalization, adaptive systems, prediction/forecasting, cognitive services, qualitative analysis (visual and natural language processing), hybrid intelligence systems, black boxing, Concrete Human-AI Interaction Designs

**Unit 2**

Intelligence, problem solving & decision making in humans and machines,Designing interactions with applied artificial intelligence, machine learning (ML) & recommender systems, AI interaction and experience design and development, Augment AI to Cope with Limitations of Human Users, Concrete Human-Interaction Designs

**Unit 3**

Human-AI benefits, victims & disasters, Understandable / relatable AI, Ethical & responsible AI, Human-AI ecosystems &markets, Interpretability and Explainability, AI Ethics, Fairness, and Equity Human-AI Co-creation in Different Domains, Interactive Visual Analytics for Machine Learning

**Unit 4**

**Case studies:**in autonomous agriculture, manufacturing, transportation, finance, healthcare, security, social media, gaming

**Suggested Books:**

Explainable Human-AI Interaction: A Planning Perspective (Synthesis Lectures on Artificial Intelligence and Machine Learning, Anagha Kulkarni, Sarath Sreedharan ,January 2022, Synthesi Publishers.

Human-AI Interaction: How We Work with Artificial Intelligence,Readyai , January 2021

| PE-CS-AIDS- 427A | Software Testing | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | **To provide an understanding of concepts and techniques for testing software and assuring its quality.** | | | | | | |
| | **Course Outcomes** | | | | | | |
| **CO 1** | Expose the criteria and parameters for the generation of test cases. | | | | | | |
| **CO 2** | Learn the design of test cases and generating test cases. | | | | | | |
| **CO 3** | Be familiar with test management and software testing activities and V&V activities. | | | | | | |
| **CO 4** | Be exposed to the significance of software testing in web and Object orient techniques. | | | | | | |

**Unit-I**

**Introduction:** Overview of software evolution, SDLC, Testing Process, Terminologies in Testing: Error, Fault, Failure, Verification, Validation, Difference between Verification and Validation, Definition of software testing, test cases, test oracles, testing process, limitations of testing.

**Unit-II**

**Functional Testing:** Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique.

**Structural Testing:** Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing.

**Unit-III**

**Reducing the number of test cases:** Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing and Slice based testing.

**Testing Activities:** Unit Testing, Levels of Testing, Integration Testing, System Testing, Debugging, Domain Testing.

**Unit-IV**

**Overview of SQM:** Concepts of Software Quality, quality attributes, software quality models: McCall, Boehm, ISO-9000, CMM.

**Miscellaneous Topics:** Stress testing, Adhoc testing, Buddy testing, Exploratory testing, Agile and extreme testing.

**Suggested Books:**

Naresh Chauhan, “Softearw Testing Principles and Practices” Oxford publications, 2012.

William Perry, “Effective Methods for Software Testing”, John Wiley & Sons, New York, 1995.

CemKaner, Jack Falk, Nguyen Quoc, “Testing Computer Software”, Second Edition, Van Nostrand Reinhold, New York, 1993.

Boris Beizer, “Software Testing Techniques”, Second Volume, Second Edition, Van Nostrand Reinhold, New York, 1990.

Louise Tamres, “Software Testing”, Pearson Education Asia, 2002

Roger S. Pressman, “Software Engineering – A Practitioner’s Approach”, Fifth Edition, McGraw-Hill International Edition, New Delhi, 2001.

Boris Beizer, “Black-Box Testing – Techniques for Functional Testing of Software and Systems”, John Wiley & Sons Inc., New York, 1995.

K.K. Aggarwal & Yogesh Singh, “Software Engineering”, New Age International Publishers, New Delhi, 2003.

Marc Roper, “Software Testing”, McGraw-Hill Book Co., London, 1994.

| PE-CS-AIDS-429A | Natural Language Processing | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3Hrs.** |
| **Purpose** | Toprovidetheunderstandingofthemathematicalandlinguisticfoundationsunderlyingapproachestothe variousareasinNLP. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Befamiliarwithsyntax andsemantics inNLP. | | | | | | |
| **CO2** | ToimplementvariousconceptsofknowledgerepresentationusingProlog. | | | | | | |
| **CO3** | Toclassifydifferentparsingtechniquesandunderstandsemantic networks. | | | | | | |
| **CO4** | ToidentifyexplainvariousapplicationsofNLP. | | | | | | |

**Unit-I**

**Basic Concepts:** concept overview, key algorithms in the noisy channelparadigm.FundamentalcomponentsofNaturalLanguageProcessing:Lexicography,syntax,semantics,prosody,phonology,pragmaticanalysis,worldknowledge.KnowledgeRepresentationschemes:Semantic net,Frames,ConceptualDependency,Scripts.

**Unit-II**

**Representing knowledge using rules:** Logic Programming, Introduction to LISP and Prolog, Rulesbaseddeductionsystems,Generalconceptsinknowledgeacquisition.**SyntaxAnalysis:**FormalLanguages and grammars, Chomsky Hierarchy, Left- Associative Grammars, ambiguous grammars,resolutionof ambiguities.

**Unit-III**

**Computation Linguistics:** Recognition and parsing of natural language structures- ATN and RTN,GeneralTechniquesofparsing-CKY,EarleyandTomitasalgorithm.Semantics:Knowledgerepresentation, semanticsnetworkslogicandinferencepragmatics,graphmodelsandoptimization.

**Unit-IV**

**Applications of NLP:** Intelligent work processor, Machine translation, user interfaces, Man-Machineinterfaces, natural language querying, tutoring and authoring systems, speech recognition, commercialuseof NLP.

**SuggestedBooks:**

Daniel Jurafsky, James H. Martin, “Speech and Language Processing: An Introduction toNaturalLanguageProcessing,ComputationalLinguisticsandSpeechRecognition”,2nd edition,PearsonEdu.,2013.

JamesAllen,“NaturalLanguageUnderstanding”,PearsonEducation,SecondEdition,2003.

IvanBratko,“Prolog:ProgrammingforArtificialIntelligence”,3rdEdition,PearsonEducation,FifthImpression2009.

G.Gazder,“NaturalLanguageprocessinginprolog”,AddisonWesley,1989.

| HM-CS-AIDS-405A | Data Visualization Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **MinorTest** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | This course will introduce the main concepts of visual analytics with a hands-on tutorial using Tableau, a leading self-service data visualization tool. Further, it aims at learning about how to create effective charts and interactive dashboards will provide the student a very useful skill applicable in many business scenarios. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | Understand and describe the main concepts of data visualization | | | | | | |
| **CO2** | Create ad-hoc reports, data visualizations, and dashboards using Tableau Desktop | | | | | | |
| **CO3** | Publish the created visualizations to Tableau Server and Tableau Public | | | | | | |
| **CO4** | Create Dashboard for real problems in Industry | | | | | | |

**Practical-1: Introduction to Tableau**

• Course introduction
• Dataviz best practices
• Getting started with Tableau Desktop
• Connecting to the tutorial dataset
• Creating the first charts
• Filtering and sorting data

**Practical-2: Common charts**

• Creating common visualizations (bar charts, line charts etc.)
• Assembling a dashboard layout
• Using dashboard filters

**Practical--3: Transform the data**

• Dataviz best practices
• Creating simple calculations in Tableau
• Using table calculations

**Practical--4: Interactions**

• Interactivity with text and visual tooltips
• Interactivity with actions (filter, highlight, URL)
• Drilldown between dashboards

**Practical--5: Advanced visualizations**

• Dataviz best practices
• Creating more advanced chart types
• Using multiple source tables

**Practical--6: Data Storytelling**

• Intro to data storytelling
• Creating a data story in Tableau
• Overview of the Tableau ecosystem
• Further learning opportunities

**Practical-7:**Implement binning visualizations for any real time dataset, Implement linear regression techniques.

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PE-LA | **Elective-I Lab** | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |

| PC-CS-AIDS-415 LA | **ANN and Deep Learning Lab** | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| 0 | 0 | 2 | 1 | 40 | 60 | 100 | 3 hrs |
| **Purpose** | Purpose To provide knowledge of various artificial neural networks and deep learning algorithms for optimization | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| CO 1 | To learn the basics of artificial neural networks concepts, various neural networks architecture | | | | | | |
| CO 2 | To explore knowledge of special types of Artificial neural networks | | | | | | |
| CO 3 | To understand the basics of Deep learning and its applications | | | | | | |
| CO4 | To imprise about the different deep learning algorithms and their applications to solve real world problems. | | | | | | |

**Practical List:**

1. To study about MATLAB.
2 Write a program to perform the basics matrix operations.
3 WAP to plot the Straight line.
5. WAP to plot the Sine curve.
6.
5. How the weight & bias value effects the output of neurons.
6. How the choice of activation function effect the output of neuron experiment with the following function purelin(n), bimary threshold(hardlim(n) haradlims(n)) ,Tansig(n) logsig(n)
7. How the weight and biased value are able to represent a decision boundary in the feature space.
8. How the Perceptron Learning rule works for Linearly Separable Problem.
9. How the Perceptron Learning rule works for Non-Linearly Separable Problem.
10. Write a program to draw a graph with multiple curve.

| PC-CS-AIDS-417LA | Data Mining & Predictive ModellingLAB | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | The objective of this course is to provide the in- depth coverage of data mining and modelling aspects along with its implementation | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | Understand the fundamental concept of Data Mining. | | | | | | |
| **CO2** | Learn Data Mining techniques for Prediction and Forecasting. | | | | | | |
| **CO3** | Compare the underlying Predictive Modelling techniques. | | | | | | |
| **CO4** | Select appropriate Predictive Modelling approaches to identify cases and apply using a suitable package such as SPSS modeller. | | | | | | |

**LIST OF EXPERIMENTS**

1. Create an Employee Table with the help of Data Mining Tool WEKA.
2. Create a Weather Table with the help of Data Mining Tool WEKA.
3. Apply Pre-Processing techniques to the training data set of Weather Table
4. Apply Pre-Processing techniques to the training data set of Employee Table
5. Normalize Weather Table data using Knowledge Flow
6. Normalize Employee Table data using Knowledge Flow.
7. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree
8. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.
9. Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set.
10. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.

| PE-CS-AIDS- 419 LA | Predictive Analysis Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | Predictive analytics is emerging as a competitive strategy across many business sectors and can set apart high performing companies. It aims to predict the probability of the occurrence of a future event such as customer churn, loan defaults, and stock market fluctuations leading to effective business management. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | Understand how to use predictive analytics tools to analyze real-life business problems. | | | | | | |
| **CO2** | Demonstrate case-based practical problems using predictive analytics techniques to interpret model outputs. | | | | | | |
| **CO3** | Learn regression, logistic regression, and forecasting using software tools such as MS Excel, SPSS, and SAS. | | | | | | |
| **CO4** | Understand to Forecasting,Time Series Analysis and develop the Model. | | | | | | |

**Practical List:**

Practical 1: Implement case studies in Predictive Analytics in marketing using Python.

Practical 2: Implement case studies in Predictive Analytics in healthcare using Python.

Practical 3: Implement Classification Model using Python.

Practical 4: Implement Clustering Model using Python.

Practical 5: Implement Time Series Model using Python.

Practical 6: Forecasting patterns in weather using Python

Practical 7: Predicting performance in sports using Python

Practical 8: Predicting employee growth in HR using Python

Practical 9: Predicting maintenance in manufacturing using Python

Practical 10: Detecting sickness in healthcare using Python

Practical 11: Predicting buying behavior in retail using Python.

| PE-CS-AIDS-421 LA | Advance Computer Architecture Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | To study various components of computer architecture. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | To implement adder circuits using basic gates | | | | | | |
| **CO2** | To understand the converter circuits using basic gates. | | | | | | |
| **CO3** | To understand the working of Multiplexer | | | | | | |
| **CO4** | To understand the various circuits for ALU, Datapath and control units. | | | | | | |

**List of Experiments**

1. To design the circuit of half adder.
2. To design the circuit of full adder.
3. To design the circuit of half subtractor.
4. To design the circuit of full subtractor.
5. To design an 8×1 Multiplexer.
6. To design a 4 bit combinational shifter.
7. To design a BCD adder.
8. To design a 4-bit adder subtractor.
9. To design an ALU.
10. To design 2:4 Decoder

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC-CS-AIDS-409LA | Project-I | 0:0:10 | 10 | 5 | 0 | 100 | 100 | 200 | 3 |

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC-CS-AIDS-413A | Industrial Training | 0 | 0 | 3 | 0 | 100 | 0 | 100 | 0 |

**B. Tech Computer Science and Engineering (Artificial Intelligence and Data Science)**
**Modified Scheme of Studies/Examination (w.e.f. Session 2023-24)**
**Semester VIII**

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC-CS-AIDS-402A | Reinforcement Learning | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 Hrs |
| 2 | HSS-404A | Entrepreneurship and Start-ups | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 Hrs |
| 3 | OEC | OEC Elective*-III | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 Hrs |
| 4 | PE | Elective* - III | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 Hrs |
| 5 | PE | Elective* - IV | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 Hrs |
| 6 | PC-CS AIDS-404LA | Reinforcement Learning Lab | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 Hrs |
| 7 | PE-LA | Elective-III Lab | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 Hrs |
| 8 | PC-CS-AIDS-408LA | Project-II | 0:0:12 | 12 | 6 | 0 | 100 | 100 | 200 | 3 Hrs |
| 9 | PC-CS-AIDS-410LA | General Fitness | 0:0:0 | 0 | 0 | 0 | 0 | 100 | 100 | 3 Hrs |
| | | **Total** | | **28** | **21** | **300** | **280** | **320** | **900** | |

| Code | **PE- Elective* - III** | Code | **PE- Elective* – IV** |
|---|---|---|---|
| PE-CS-AIDS- 414A | Social Networks | PE-CS-AIDS- 422A | Internet of Things |
| PE-CS-AIDS- 416A | Application of Data Science in Industry | PE-CS-AIDS- -424A | Block Chain |
| PE-CS-AIDS- 420A | Neural Network and Fuzzy Logic | PE-CS-AIDS- 426A | Next Generation Databases |

| **Code** | **OEC Elective*-III** | **Code** | **PE-LA- Elective* III Lab** |
|---|---|---|---|
| OE-CS- AIDS-402 | Cyber Security | PE-CS-AIDS- 414 LA | Social Networks Lab |
| OE-CS- AIDS-404 | Information Retrieval | PE-CS-AIDS- 416 LA | Application of Data Science in Industry Lab |
| OE-CS- AIDS-406 | Robotics and Intelligent Systems | PE-CS-AIDS- 420 LA | Neural Network and Fuzzy Logic Lab |
| OE-CS- AIDS-408 | Agile Software Engineering | **Note: *The students will choose any two departmental electives courses and One Open Elective course out of the given elective list in VIII** | |
| OE-CS- AIDS-410 | Image Processing and Recognition | | |

| PC-CS-AIDS-402A | Reinforcement Learning | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs** |
| **Purpose** | Purpose To provide knowledge of various Reinforcement Learning Algorithms | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| CO 1 | To learn the basics of Reinforcement Learning concepts, various Reinforcement Learning architecture | | | | | | |
| CO 2 | To explore knowledge of various process of Reinforcement Learning | | | | | | |
| CO 3 | To understand the basics of Reinforcement Learning models | | | | | | |
| CO 4 | To implies about the different Reinforcement Learning algorithms and their applications to solve real world problems. | | | | | | |

**UNIT-1**

**Introduction to Reinforcement Learning**: Origin and history of Reinforcement Learning research. Its connections with other related fields and with different branches of machine learning. The Reinforcement Learning Process Elements of Reinforcement Learning RL Agent Taxonomy Reinforcement Learning Problem.

**Unit-II**

**Markov Decision Process**: Introduction to RL terminology, Markov property, Markov chains, Markov reward process (MRP). Introduction to and proof of Bellman equations for MRPs along with proof of existence of solution to Bellman equations in MRP. Introduction to Markov decision process (MDP), state and action value functions, Bellman expectation equations, optimality of value functions and policies, Bellman optimality equations.

**Unit-III**

**Monte Carlo Methods for Model Free Prediction and Control**: Overview of Monte Carlo methods for model free RL, First visit and every visit Monte Carlo, Monte Carlo control, On policy and off policy learning, Importance sampling.

TD Methods Incremental Monte Carlo Methods for Model Free Prediction, Overview TD(0), TD (1) and TD(λ), k-step estimators, unified view of DP, MC and TD evaluation methods, TD Control methods - SARSA, Q-Learning and their variants.

**Unit-IV**

**Function Approximation Methods**: Getting started with the function approximation methods, Revisiting risk minimization, gradient descent from Machine Learning, Gradient MC and Semi-gradient TD (0) algorithms, Eligibility trace for function approximation, Afterstates, Control with function approximation, least squares, Experience replay in deep Q-Networks

**Suggested Books:**

Richard S. Sutton and Andrew G. Barto “An Introduction to Reinforcement Learning Enes Bilgin “ Mastering Reinforcement Learning with Python: Build next-generation, self-learning models using reinforcement learning techniques and best practices” 1st Edition Kindle

| HSS-404A | Entrepreneurship and Start-ups | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To expose students to the joys and skills of being an entrepreneur. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To understand the basics of Entrepreneurship. | | | | | | |
| **CO2** | To learn the basics of Creative and Design Thinking. | | | | | | |
| **CO3** | To apply the Business Enterprises. | | | | | | |
| **CO4** | To know about business models . | | | | | | |

**Unit I**

Introduction to Entrepreneurship, Meaning and concept of entrepreneurship, the history of entrepreneurship development, role of entrepreneurship in economic development, Myths about entrepreneurs, types of entrepreneurs.

**Unit II**

The skills/ traits required to be an entrepreneur, Creative and Design Thinking, the entrepreneurial decision process, entrepreneurial success stories.

**Unit III**

Crafting business models and Lean Start-ups: Introduction to business models; Creating value propositions-conventional industry logic, value innovation logic; customer focused innovation; building and analysing business models; Business model canvas, Introduction to lean start-ups, Business Pitching.

**Unit IV**

Institutions Supporting Small Business Enterprises: Central level institutions. State level institutions. Other agencies. Industry Associations. Class exercise- discussions on current government schemes supporting entrepreneurship and finding out which scheme will most suit the business plan devised by the student.

**Text Books:**


- Kuratko, D , Hornsby J.S. (2017) New Venture Management: Entrepreneur's roadmap
- Hisrich, R.D., Manimala, M.J., Peters, M.P., Shepherd, D.A.: Entrepreneurship, Tata McGraw Hill
- Ries, Eric(2011)The lean Start-up: How constant innovation creates radically
- S. Carter and D. Jones-Evans (2012), Enterprise and small business- Principal Practice and Policy, Pearson Education (2006)

| OE-CS-AIDS-402 | Cyber Security | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | 1. Learn the foundations of Cyber security and threat landscape.<br>2. To equip students with the technical knowledge and skills needed to protect and defend<br>against cyber threats.<br>3. To develop skills in students that can help them plan, implement, and monitor cyber security mechanisms to ensure the protection of information technology assets. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | Understand the cyber security threat landscape. | | | | | | |
| **CO2** | Develop a deeper understanding and familiarity with various types of cyber-attacks, cyber crimes, vulnerabilities and remedies thereto. | | | | | | |
| **CO3** | Increase awareness about cyber-attack vectors and safety against cyber-frauds | | | | | | |
| **CO4** | Analyze and evaluate existing legal framework and laws on cyber security. | | | | | | |

**Unit-I**

**Overview of cyber security:** Cyber security increasing threat landscape, Cyber security terminologies- Cyberspace, attack, attack vector, attack surface, threat, risk, vulnerability, exploit, exploitation, hacker, non-state actors, Cyber terrorism, Protection of end user machine, Critical IT and National Critical Infrastructure, Cyberwarfare, Case Studies.

**Unit-II**

**Cyber Crimes**: Cybercrimes targeting Computer systems and Mobiles- data diddling attacks, spyware, logic bombs, DoS, DDoS, APTs, virus, Trojans, ransomware, data breach, Online scams and frauds- email scams, Phishing, Vishing, Smishing, Online job fraud, Online sextortion, Debit/credit card fraud, Online payment fraud, Cyberbullying, website defacement, Cyber-squatting, Pharming, Cyber espionage, Crypto jacking, Darknet- illegal trades, drug trafficking, human trafficking., Social Media Scams & Frauds- impersonation, identity theft, job scams, misinformation, fake news cybercrime against persons -cyber grooming, child pornography, cyber stalking., Social Engineering attacks, Cyber Police stations, Crime reporting procedure, Case studies.

**Unit-III**

**Cyber Laws and Data Privacy:** passive Cybercrime and legal landscape around the world, IT Act,2000 and its amendments. Limitations of IT Act, 2000. Cybercrime and punishments, Cyber Laws and Legal and ethical aspects related to new technologies- AI/ML, IoT, Block chain, Darknet and social media, Cyber Laws of other countries, Case Studies.

**Data Privacy and Data Security:** Defining data, meta-data, big data, non-personal data. Data protection, Data privacy and data security, Personal Data Protection Bill and its compliance, Data protection principles.

**Unit-IV**

**Data Privacy and Data Security:** Big data security issues and challenges, Data protection regulations of other countries- General Data Protection Regulations (GDPR),2016 Personal Information Protection and Electronic Documents Act (PIPEDA)., social media- data privacy and security issues.

**Cyber security Management, Compliance and Governance:** Cyber security Plan- cyber security policy, cyber crises management plan., Business continuity, Risk assessment, Types of security controls and their goals, Cyber security audit and compliance, National cyber security policy and strategy.

**Suggested Books:**

Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd.

Nelson Phillips and Enfinger Steuart, “Computer Forensics and Investigations”, Cengage Learning, New Delhi, 2009.

Sunit Belapure and Nina Godbole, “Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives”, Wiley India Pvt. Ltd.

| OE-CS-AIDS-404 | Information Retrieval | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | The Major objective of an Information Retrieval system is minimization of human resources required in the finding of needed information to accomplish a task. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO 1** | Ability to apply information retrieval principles and retrieval models to locate relevant information from large collections of data | | | | | | |
| **CO 2** | Apply various indexing technique and understanding of different data structures. | | | | | | |
| **CO 3** | Implementation of various clustering and searching techniques. | | | | | | |
| **CO 4** | Understanding of information visualization and various advance topics. | | | | | | |

**Unit-I**

**Introduction to Information Retrieval Systems:** Definition of Information Retrieval System, Objectives of Information Retrieval Systems, Functional Overview, Relationship to Database Management Systems, Digital Libraries and Data Warehouses.

**Information Retrieval System Capabilities:** Search Capabilities, Browse Capabilities, Miscellaneous Capabilities, Retrieval Models: Boolean, vector space, TFIDF, Okapi, probabilistic, language modeling, latent semantic indexing. Vector space scoring. The cosine measure. Efficiency considerations. Document length normalization.

**Unit-II**

**Cataloging and Indexing:** History and Objectives of Indexing, Indexing Process, Automatic Indexing, Classes of Automatic Indexing, Statistical Indexing, Natural Language, Concept Indexing, Hypertext Linkages, Information Extraction.

**Data Structure:** Introduction to Data Structure, Stemming Algorithms, Inverted File Structure, N-Gram Data Structures, PAT Data Structure, Signature File Structure, Hypertext and XML Data Structures, Hidden Markov Models.

**Unit-III**

**Document and Term Clustering:** Introduction to Clustering, clustering versus classification, Thesaurus Generation, Item Clustering, Hierarchy of Clusters.Text Clustering: Partitioning methods, k-means clustering, Mixture of Gaussians model, Hierarchical agglomerative clustering, clustering terms using documents.

**User Search Techniques:** Search Statements and Binding, Similarity Measures and Ranking, Relevance Feedback, Selective Dissemination of Information Search, Weighted Searches of Boolean Systems, Searching the INTERNET and Hypertext.

**Text Search Algorithms:** Introduction to Text Search Techniques, Software Text Search Algorithms, Hardware Text Search Systems.

**Unit-IV**

**Information Visualization:** Introduction to Information Visualization, Cognition and Perception, Information Visualization Technologies.

**Advanced Topics:** Summarization, Topic detection and tracking, Personalization, Question answering, Cross language information retrieval.

**Suggested Books:**

Introduction to Information Retrieval. Christopher D. Manning, Prabhakar Raghavan, and Hinrich Schuetze, Cambridge University Press, 2007.

Search Engines: Information Retrieval in Practice. Bruce Croft, Donald Metzler, and Trevor Strohman, Pearson Education, 2009.

Modern Information Retrieval. Baeza-Yates Ricardo and Berthier Ribeiro-Neto. 2nd edition, Addison-Wesley, 2011.

Information Retrieval: Implementing and Evaluating Search Engines. Stefan Buttcher, Charlie Clarke, Gordon Cormack, MIT Press, 2010.

Information Storage and Retrieval Systems – Theory and Implementation, Second Edition, Gerald J. Kowalski, Mark T. Maybury, Springer.

| OE-CS-AIDS-406 | Robotics and Intelligent Systems | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3** |
| **Purpose** | To impart understanding of the main abstractions and reasoning for Robotics and Intelligent Systems | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Understand the basic terminologies in Robotics to develop intelligent systems | | | | | | |
| **CO2** | Apply the random search and heuristic search for intelligent systems. | | | | | | |
| **CO3** | Understand the abstractions and reasoning for intelligent systems | | | | | | |
| **CO4** | Apply the rule based methods in intelligent systems | | | | | | |

**Unit-I**

**Introduction** to robotics- History, growth; Robot applications- Manufacturing industry, defense, rehabilitation, medical, Robot mechanisms, type of robots and use of robots in different area.

**Unit-II**

Degree of freedom, classification and specifications of Robots, controller, actuator and drives. Sensors in robot – Touch sensors-Tactile sensor – Proximity and range sensors. Force Sensor-Light sensors, Pressure sensors, Introduction to Machine Vision and Artificial Intelligence.

U**nit-III**

**Intelligent Systems:** Knowledge acquisition, Computational intelligence, Rule-based systems, Forward-chaining (a data-driven strategy), Conflict resolution, Backward chaining (a goal-driven strategy), Sources of uncertainty, Bayesian updating, Certainty theory.

**Unit-IV**

**Possibility theory:** fuzzy sets and fuzzy logic, Object-oriented systems, Data abstraction, Inheritance, Encapsulation, Unified Modeling Language (UML), Dynamic (or late) binding. **Key Application Areas:** Expert System, Decision Support Systems, **Deep Learning:** Speech and vision, natural Language processing, Information Retrieval, Semantic Web.

**SUGGESTED BOOKS:**

Artificial Intelligence' RB Mishra, PHI
Introduction to Artificial Intelligence, Charnaik, Pearson.
Artificial Intelligence by Elaine Rich, Kevin Knight and Shivashankar B Nair, Tata McGraw Hill. Introduction to Artificial Intelligence and Expert Systems by Dan W Patterson, Pearson Education.

| OE-CS-AIDS-408 | Agile Software Engineering | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **MajorTest** | **MinorTest** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | This course makes student learn the fundamental principles and practices associated with each of the agile development methods. To apply the principles and practices of agile software development on a project of interest and relevance to the student. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | Analyze existing problems with the team, development process and wider organization | | | | | | |
| **CO2** | Apply a thorough understanding of Agile principles and specific practices | | | | | | |
| **CO3** | Select the most appropriate way to improve results for a specific circumstance or need | | | | | | |
| **CO4** | Judge and craft appropriate adaptations to existing practices or processes depending upon analysis of typical problems and risk analysis. | | | | | | |

**Unit-I**

**Agile Software Development:** Basics and Fundamentals, of Agile Process Methods, Values of Agile, Principles of Agile, stakeholders, Challenges Lean Approach: Waste Management, Kaizen and Kanban, add process and products add value. Roles related to the lifecycle, differences between Agile and traditional plans, differences between Agile plans at different lifecycle phases. Testing plan links between testing, roles and key techniques, principles, understand as a means of assessing the initial status of a project/ How Agile helps to build quality

**Unit-II**

**Agile and Scrum Principles:** Agile Manifesto, Twelve Practices of XP, Scrum Practices, Applying Scrum. Need of scrum, working of scrum, advanced Scrum Applications, Scrum and the Organization, scrum values Agile Product Management: Communication, Planning, Estimation Managing the Agile Approach Monitoring progress, Targeting and motivating the team, managing business involvement, Escalating issue. Quality, Risk, Metrics and Measurements, Managing the Agile Approach Monitoring progress, Targeting and motivating the team, managing business involvement and Escalating issue

**Unit-III**

**Agile Requirements:** User Stories, Backlog Management. Agile Architecture: FeatureDriven Development. Agile Risk Management: Risk and Quality Assurance, Agile Tools Agile Testing: Agile Testing Techniques, Test-Driven Development, User Acceptance Test

**Unit-IV**

**Agile Review:** Agile Metrics and Measurements, The Agile approach to estimating and project variables, Agile Measurement, Agile Control: the 7 control parameters. Agile approach to Risk, The Agile approach to Configuration Management, The Atern Principles, Atern Philosophy,The rationale for using Atern, Refactoring, Continuous integration, Automated Build Tools

**Suggested Books:**

Robert C. Martin ,Agile Software Development, Principles, Patterns, and Practices Alan Apt Series (2018)

Succeeding with Agile : Software Development Using Scrum, Pearson (2017)

| OE-CS-AIDS-410 | Image Processing and Recognition | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | To imparts knowledge in the area of image and image processing, fundamentals of digital image processing and also to learn the fundamentals of pattern recognition and to choose an appropriate feature. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO 1** | To Understand Basics of Image formation and transformation using sampling and quantization | | | | | | |
| **CO 2** | To Understand different types signal processing techniques used for image sharpening and smoothing | | | | | | |
| **CO 3** | To understand the nature and inherent difficulties of the pattern recognition problems. | | | | | | |
| **CO 4** | Understand concepts, trade-offs, and appropriateness of the different feature types and classification techniques such as Bayesian, maximum likelihood, etc | | | | | | |

**Unit-I INTRODUCTION TO IMAGE PROCESSING AND RESTORATION**

Image formation, image geometry perspective and other transformation, stereo imaging elements of visual perception. Digital Image-sampling and quantization serial & parallel Image processing**.** Image Restoration-Constrained and unconstrained restoration Wiener filter, Motion blur remover.

**Unit-II SEGMENTATION TECHNIQUES**

Segmentation Techniques-thresh holding approaches, region growing, relaxation, line and edge detection approaches, edge linking, supervised and unsupervised classification techniques, remotely sensed image analysis and applications, Shape Analysis – Gestalt principles, shape number, moment Fourier and other shape descriptors, Skelton detection.

**Unit-III PATTERN RECOGNITION**

Bayesian Decision Theory, Classifiers, Normal density and discriminant functions, Parameter estimation methods: Maximum-Likelihood estimation, Bayesian Parameter estimation

**Unit-IV STATISTICAL PATTERN RECOGNITION:** Dimension reduction methods – Principal Component Analysis (PCA), Fisher Linear discriminant analysis, Expectation-maximization (EM), Hidden Markov Models (HMM), Gaussian mixture models.

**Suggested Books**

Digital Image Processing – Ganzalez and Wood, Addison Wesley, 1993.

Fundamental of Image Processing – Anil K.Jain, Prentice Hall of India.
Pattern Classification – R.O. Duda, P.E. Hart and D.G. Stork, Second Edition John Wiley, 2006
An Introduction to Digital Image Processing – Wayne Niblack, Prentice Hall, 1986
Pattern Recognition and Machine Learning – C. M. Bishop, Springer, 2009.
Pattern Recognition – S. Theodoridis and K. Koutroumbas, 4th Edition, Academic Press,2009

| PE-CS-AIDS- 414A | Social Networks | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hrs** |
| **Purpose** | Students will be able to use Social networks for business and personal use, conducting social network analysis, social network developer tools and social network concepts for solving real-world issues. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Demonstrate proficiency in the use of social networks for business and personal use | | | | | | |
| **CO2** | Demonstrate proficiency in the use of social network analysis concepts and techniques. | | | | | | |
| **CO3** | Demonstrate proficiency in the use of social network developer tools. | | | | | | |
| **CO4** | Examine the various types of processors and demonstrate proficiency in the use of social network concepts for solving real world issues. | | | | | | |

**Unit I INTRODUCTION TO SEMANTIC WEB:**Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - Social Network analysis: Development of Social Network Analysis - Key concepts and measures in network analysis - Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities - Web-based networks - Applications of Social Network Analysis.

**Unit II MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION**

Ontology and their role in the Semantic Web: Ontology-based knowledge Representation - Ontology languages for the Semantic Web: Resource Description Framework - Web Ontology Language - Modeling and aggregating social network data: State-of-the-art in network data representation - Ontological representation of social individuals - Ontological representation of social relationships - Aggregating and reasoning with social network data - Advanced representations.

**Unit III EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS**

Extracting evolution of Web Community from a Series of Web Archive - Detecting communities in social networks - Definition of community - Evaluating communities - Methods for community detection and mining - Applications of community mining algorithms - Tools for detecting communities social network infrastructures and communities - Decentralized online social networks.

## Unit IV PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES

Understanding and predicting human behavior for social communities - User data management - Inference and Distribution - Enabling new human experiences - Reality mining - Context - Awareness - Privacy in online social networks - Trust in online environment - Trust models based on subjective logic - Trust network analysis.

**TEXT BOOKS:**

Peter Mika, Social Networks and the Semantic Web‖, First Edition, Springer 2007.
Borko Furht, Handbook of Social Network Technologies and Applications, 1st Edition, Springer, 2010.

| PE-CS-AIDS-416A | Application of Data Science in Industry | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | Introduce the mathematical foundations required for data science and R Programming. Students will learn the data analytics problem solving framework**.** | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | Describe a flow process for data science problems | | | | | | |
| **CO2** | Classify data science problems into standard typology | | | | | | |
| **CO3** | Develop R codes for data science solutions | | | | | | |
| **CO4** | Correlate results to the solution approach followed and Construct use cases to validate approach and identify modifications required | | | | | | |

**Unit-I**

**Linear algebra for Data science:** Algebraic view - vectors, matrices, product of matrix & vector, rank, null space, solution of over-determined set of equations and pseudo-inverse, Geometric view - vectors, distance, projections, eigenvalue decomposition.

**Unit-II**

**Statistics for Data Science:** descriptive statistics, notion of probability, distributions, mean, variance, covariance, covariance matrix, understanding univariate and multivariate normal distributions, introduction to hypothesis testing, confidence interval for estimates.

**Unit-III**

**Optimization for Data Science:** Typology of data science problems and a solution framework, Simple linear regression and verifying assumptions used in linear regression, Multivariate linear regression, model assessment, assessing importance of different variables, subset selection Classification using logistic regression, Classification using kNN and k-means clustering.

**Unit-IV**

**Data Science in Industry:** Case Study of Walmart supply Chain Management, Solving Data Analysis Problems using case study of Google Company, Case study ofOLAP tool for the Fast-Food Industry, Real-Time Data Streaming with Apache Kafka with Company data set, Real-Time Data Processing using Spark Streaming, Building Automated Data Pipelines with Airflow, Analytics using PySpark.

**Suggested Books**:

Guandong Xu ,Yanchun Zhang and Lin Li, Web Mining and Social Networking Techniques and applications‖, First Edition, Springer, 2011.
Dion Goh and Schubert Foo, Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively‖, IGI Global Snippet, 2008.

| PE-CS-AIDS-420A | Neural Network and Fuzzy Logic | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3Hrs** |
| **Course Outcomes** | | | | | | | |
| **CO1** | Understand the concept of Artificial Intelligence, search techniques and acknowledge representation issues | | | | | | |
| **CO2** | Understanding reasoning and fuzzy logic for artificial intelligence | | | | | | |
| **CO3** | Students will be able to learn defuzzied fiction and fuzzy measures | | | | | | |
| **CO4** | Students will be able to learn the applications of fuzzy logic and hybrids of computing techniques | | | | | | |

**Unit I–INTRODUCTION**

Artificial neural network: Introduction, characteristics- learning methods – taxonomy – Evolution of neural networks-basic models-important technologies-applications. Fuzzy logic: Introduction-crisp sets-fuzzy sets
- crisp relations and fuzzy relations: cartesian product of relation - classical relation, fuzzy relations, tolerance and equivalence relations, non-iterative fuzzy sets. Genetic algorithm- Introduction - biological background - traditionaloptimizationandsearchtechniques-Geneticbasicconcepts.

**Unit II-NEURAL NETWORKS**

McCulloch-Pitts neuron-linear separability-Hebb network-supervised learning network: perceptron networks' adaptive linear neuron, multiple adaptive linear neuron, BPN, RBF, TDNN- associative memory network: auto- associative memory network, hetero-associative memory network, BAM, hop field networks, iterative auto associative memory network & iterative associative memory network – unsupervised learning networks: Kohonen self-organizing feature maps, LVQ–CP networks, ART network.

**Unit III- FUZZY LOGIC**

Membership functions: features, fuzzification, methods of membership value assignments- Defuzzification: lambda cuts - methods - fuzzy arithmetic and fuzzy measures: fuzzy arithmetic - extension principle - fuzzy measures - measures of fuzziness -fuzzy integrals - fuzzy rule base and approximate reasoning: truth values , fuzzy propositions, formation of rules- ,aggregation of fuzzy rules, fuzzy reasoning-fuzzy inference systems-overview of fuzzy expert system-fuzzy decision making.

**Unit IV-HYBRID SOFT COMPUTING TECHNIQUES & APPLICATIONS**

Neuro-fuzzy hybrid systems - genetic neuro hybrid systems - genetic fuzzy hybrid and fuzzy genetic hybrid systems – simplified fuzzy ARTMAP - Applications: A fusion approach of multispectral images with SAR, optimization of traveling salesman problem using genetic algorithm approach, soft computing-based hybrid fuzzy controllers.

**Suggested Books:**

Elaine Rich and Kevin Knight "Artificial Intelligence", 2nd Edition,Tata Mcgraw-Hill, 2005.
Stuart Russel and Peter Norvig,"Artificial Intelligence:AModernApproach",3rd
T1.Kliryvan- Fuzzy System & Fuzzy logic Prentice Hall of India, First Edition.
Lawrence Fussett-fundamental of Neural network Prentice Hall,FirstEdition.
Bart Kosko, ―Neural network and Fuzzy System‖-PrenticeHall-1994.
Vallusu Rao and Hayagvna Rao,―C++Neural network and fuzzy logic‖-BPB Publication, NewDelhi,1996

| Code | PE-Elective-IV |
|---|---|
| PE-CS-AIDS- 422A | Internet of Things |
| PE-CS-AIDS- -424A | Block Chain |
| PE-CS-AIDS- 426A | Natural Language Processing |

| **PE-CS-AIDS-422A** | **Internet of Things** | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | This course will illuminate the students in the concepts of calculus. To enlighten the learners in the concept of differential equations and multivariable calculus. To equip the students with standard concepts and tools at an intermediate to advanced level mathematics to develop the confidence and ability among the students to handle various real world problems and their applications. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO 1** | Understanding of basic concepts of Internet of things. | | | | | | |
| **CO 2** | Implementation of programming fundamentals on Arduino. | | | | | | |
| **CO 3** | Understanding of various sensors and IoT protocols. | | | | | | |
| **CO 4** | Importance of cryptographic fundamentals in Internet of things. | | | | | | |

**Unit-1**

**IOT − OVERVIEW -** Introduction to IoT, Key Features, Advantages, Disadvantages, IoT Standards, Components of IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models.

**Unit-II**

**The Arduino Platform -**The Arduino Open-Microcontroller Platform, Arduino Basics, Arduino Board Layout & Architecture, Introduction to various Functions, reading from Sensors, Programming fundamentals (C language), Arduino Programming & Interface of Sensors, Interfacing sensors with Arduino, Programming Arduino.

**Unit-III**

**IoT Sensor and Actuator –** Sensor, Type of Sensor, Use of Sensor, Actuator, Type of Actuator, Basic of IoT Networking, Gateway Technology for IoT, IoT challenge, connectivity technology.

**IoT Protocol:** Architecture and Design Principles for IoT: Internet connectivity, Internet-based communication, IPv4, IPv6, 6LoWPAN protocol, IP Addressing in the IoT,

**Unit-IV**

**Cryptographic fundamentals for IOT -**Cryptographic primitives and its role in IoT – Encryption, and Decryption – Hashes – Digital Signatures – Random number generation – Cipher suites – key management fundamentals – cryptographic controls built into IoT messaging and communication protocols – IoT Node Authentication

**IoT & M2M -**Machine to Machine, Difference between IoT and M2M, Software define Network Challenges in IoT Design challenges, Development challenges, Security challenges, and other challenges.

**Suggested Books**:

Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer.

Programming Arduino: Getting Started with Sketches, Second Edition, Mc Graw Hill, Simon Monk.

| PE-CS-AIDS-424A | Block Chain | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | To give students the understanding of emerging abstract models for Blockchain Technology and to familiarise with the functional/operational aspects of cryptocurrency eco-system. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO 1** | Understanding of distributed systems and importance of security in networks. | | | | | | |
| **CO 2** | Basic Concept of blockchain and application of blockchain in various domains. | | | | | | |
| **CO 3** | Knowledge of various hash functions and consensus algorithms. | | | | | | |
| **CO 4** | Understanding the concepts of Ethereum blockchain and tools used for implementation. | | | | | | |

**Unit-I**

**Distributed Systems:** Introduction, benefits and limitations, types, applications. Consistency and replication in distributed environment. CAP theorem, Distributed computing: concept, pros and cons of using distributed computing. Client-Server architecture, peer-to-peer architecture. Byzantine Generals problem.

**Security in Networks:** Concept, Types of Security breaches, attacks, control measures, Classifying cryptosystems, classical cryptosystems, block cipher modes of operation, DES encryption and decryption, triple DES, AES encryption and decryption.

**Unit-II**

**Block chain:** Introduction to block chain, Bitcoin and Block ChainHistory, problem of double spending. Architecture of Block chain, structure of block, genesis block, transaction life cycle, centralized and decentralized network, characteristics, Types of Block chain: Public, Private, hybrid. benefits and limitations of Block chain.

**Use cases:**Block chain in Financial applications, supply chains, healthcare, real estate and media.

**Unit-III**

Hash Function, secure hash algorithm (SHA) and types, Digital signature, RSA digital signature algorithm, elliptic curve digital signature algorithm, zero-knowledge proofs.

Mining Mechanism: mining, mining reward, mining pool, hash rate, difficulty. Distributed ledger, distributed consensus: proof of work, proof of stake, Delegated Proof of Stake, Practical Byzantine Fault Tolerance, Proof of Elapsed Time. Merkle tree, soft and hard fork, sybil attack.

**Unit-IV**

**Ethereum ecosystem:** Ethereum virtual machine, types of accounts, keys and addresses, bytecode, smart contracts, oracle, Ethereum network: mainnet, testnet, private net. Tools: Remix, Nodejs, ganache, digital wallet.

**Suggested Books**:

Tanenbaum A.S., Steen M.V., “Distributed Systems: Principles and Paradigms”, Prentice Hall of India.

Behrouz A. Forouzan, Debdeep Mukhopadhyay, Cryptography and Network Security, 3rd Edition, Mc Graw Hill Education, 2016.

Mastering Blockchain: Distributed ledger technology, decentralization, and smart contracts explained, 2nd Edition by Imran Bashir

Ethereum: Blockchains, Digital Assets, Smart Contracts, Decentralized Autonomous Organizations”, by Henning Diedrich

| PE-CS-AIDS-426A | Next Generation Databases | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **MajorTest** | **MinorTest** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3Hrs.** |
| **Purpose** | To understand the basic concepts and terminology related to Unstructured Database. Familiarize students with databases like NOSQL, XML. Implement and evaluate complex, scalable database systems, with emphasis on providing experimental evidence for design decisions. | | | | | | |
| **Course Outcome** | | | | | | | |
| **CO1** | Implement and evaluate complex, scalable database systems, with emphasis on providing experimental evidence for design decisions. | | | | | | |
| **CO2** | Demonstrate the management of structured and unstructured data management with recent tools and technologies. | | | | | | |
| **CO3** | Demonstrate competency in designing No SQL database management systems | | | | | | |
| **CO4** | Demonstrate competency in designing XML Databases | | | | | | |

**Unit-I**

Introduction: Three Database Revolutions, The Third Database Revolution, Google, Big Data, and Hadoop

**Unit-II**

Sharding, Amazon, and the Birth of NoSQL, Document Databases, JSON Document Databases, Tables are Not Your Friends: Graph Databases, Column Databases, Column Database Architectures

**Unit-III**

XML, XML Databases – XML Tools and Standards, XML Databases, XML Support in relational systems, JSON Document Databases, MOngoDB, Column Databases, Graph Databases

**Unit-IV**

Distributed Database Patterns, Nonrelational Distributed Databases, MongoDB Sharding and Replication, HBase. Consistency Models, Consistency in MongoDB, Data Models and Storage, Languages and Programming Interfaces, NoSQL APIs

**Suggested Books:**

Next Generation Databases, Mr. Guy Harrison, Apress

Beginning JSON,by Mr. Ben Smith, Apress

NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot by Pramod Sadalage, Martin Fowler Persistence, 1st Edition.

| PC-CS-AIDS-404LA | Reinforcement Learning Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | To implement the concepts of Reinforcement Learning Algorithms. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | Implement Python programming advance and paradigm. | | | | | | |
| **CO2** | Implement various process of Reinforcement Learning | | | | | | |
| **CO3** | Implement various Reinforcement Learning models | | | | | | |
| **CO4** | Implement various Reinforcement Learning algorithms. | | | | | | |

| | |
|---|---|
| 1. | The probability that it is Friday and that a student is absent is 3 %. Sincethereare5schooldaysinaweek, theprobability that it is Friday is 20%.Whatisthe probability that a student is absent given that today is Friday?<br>Apply Bayes rule in python to get the result. (Ans:15%) |
| 2. | Extract the data from database using python |
| 3. | Implement k-nearest neighbors classification using python |
| 4. | Given the following data, which specify classifications for nine combinations of VAR1 and VAR2 predict a classification for a case where VAR1=0.906 and VAR2=0.606,using there sultofk-meansclusteringwith3means(i.e.,3centroids)<br>VAR1 VAR2 CLASS<br>1.713 1.586 0<br>0.180 1.786 1<br>0.353 1.240 1<br>0.940 1.566 0<br>1.486 0.759 1<br>1.266 1.106 0<br>1.540 0.419 1<br>0.459 1.799 1<br>0.773 0.186 1 |

| | |
|---|---|
| 5. | The following training examples map description so find visuals onto high, medium and low Credit-worthiness.<br>medium skiing design single twenties no ->high Risk<br>high golf trading married forties yes ->low Risk<br>ow speedway transport married thirties yes ->med Risk<br>medium football banking single thirties yes ->low Risk<br>high flying mediamarried fifties yes ->high Risk<br>ow football security single twenties no ->med Risk<br>medium golf media single thirties yes ->med Risk<br>medium golftransport married forties yes ->low Risk<br>high skiing bankingsingle thirties yes ->high Risk<br>ow golf unemployed married forties yes ->high Risk<br>Input attributes are (from left to right) income, recreation, job, status, age- group, home-owner. Find the unconditional probability of `golf' and the conditional probability of `single' given `med Risk' in the dataset? |
| 6. | Implement linear regression using python. |
| 7. | Implement Naïve Bayes theorem to classify the English text |
| 8. | Implement an algorithm to demonstrate the significance of genetic algorithm |

| PE-CS-AIDS-414 LA | Social Networks Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hours** |
| **Purpose** | Students will be able to use Social networks for business and personal use, conducting social network analysis, social network developer tools and social network concepts for solving real-world issues. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Demonstrate proficiency in the use of social networks for business and personal use | | | | | | |
| **CO2** | Demonstrate proficiency in the use of social network analysis concepts and techniques. | | | | | | |
| **CO3** | Demonstrate proficiency in the use of social network developer tools. | | | | | | |
| **CO4** | Examine the various types of processors and demonstrate proficiency in the use of social network concepts for solving real world issues. | | | | | | |

**LIST OF PRACTICALS:**

1. Understanding uses various social networking sites.
2. Use social networks for business as well as professional use.
3. Understand and learn what social network analysis is.
4. Use any social network analysis development tools.
5. Understand the basic concept of machine learning in social network.
6. Understand public sector media using big data analysis.
7. Use privacy while creating social networking Content.
8. Using social network concepts for solving any real-life world issues.
9. Use natural language processing and linguistics for information and relation extraction.
10. Write a note on Subgroups, Cliques, Block models, Ego networks, Social capital, structural holes, equivalence

| PE-CS-AIDS-416LA | Application of Data Science in Industry Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | Introduce the mathematical foundations required for data science and R Programming. Students will learn the data analytics problem solving framework. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | Describe a flow process for data science problems | | | | | | |
| **CO2** | Classify data science problems into standard typology | | | | | | |
| **CO3** | Develop R codes for data science solutions | | | | | | |
| **CO4** | Correlate results to the solution approach followed and Construct use cases to validate approach and identify modifications required | | | | | | |

**List of Experiments:**

**Practical 1:**
**D**ata Science in in Delivery Logistics using Data Visualization Tool

**Practical 2:**

**Create Dashboard and Story on IPL Cricket Match data** using Data Visualization Tool

**Practical 3:**

**Create Dashboard and Story on** Transport **data** using Data Visualization Tool

**Practical 4:**

**Create Dashboard and Story on** E-Commerce **data** using Data Visualization Tool

**Practical 5:**

**Create Dashboard and Story on** Health Care **data** using Data Visualization Tool
**Practical 6:**

**Create Dashboard and Story on** Airline Routing Planning **data** using Data Visualization Tool
**Practical 7:**

**Create Dashboard and Story on** Medicine and Drug Development **data** using Data Visualization Tool

| PE- CS-AIDS-420 LA | Neural Network and Fuzzy Logic Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | This Lab introduces the basics of Neural Networks and essentials of Artificial Neural Networks with Single Layer,FLCs,PI and Multilayer Feed Forward Networks. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | To give students an understanding of foundational concepts of fuzzy control primarily based on fuzzy set theory. To know operations on fuzzy sets, fuzzy relations. | | | | | | |
| **CO2** | To understand basic building blocks of Mamdani Fuzzy Logic Controllers (FLCs). | | | | | | |
| **CO3** | To get an insight into Fuzzification, Fuzzy Inferencing, Defuzzification. | | | | | | |
| **CO4** | To understand the nonlinearity of different blocks of FLC and to analyze adaptive issues in the stability issues of FLCs. | | | | | | |

**List of Experiments:**

1. To implement PI, PD & PID controllers for temperature control of an oven on pilot plant &/or on a simulation kit.

2. To implement PI, PD & PID controllers for water level control of a single & two tank coupled systems on pilot plant &/or on a simulation kit.

3. To implement Fuzzy controller for temperature control of an oven & for water level control of a single & two tank coupled systems

4. To implement Fuzzy controller for speed control of dc motor.

5. To observe the effects of nonlinearities (such as saturation, backlash etc.) on the performance of PI, PD & PID controllers used for a first order system.

6. To observe the effects of nonlinearities (such as saturation, backlash etc.) on the performance of PI, PD & PID controllers used for a second order system.

7. To observe the effects of parametric disturbances on the performance of PI, PD, PID & Fuzzy

controllers.

8. To observe the effects of load disturbances on the performance of PI, PD, PID & Fuzzy controllers.

9. To control speed of a dc motor using choppers.

10. Implementation of speed control of a stepper motor.

11. To implement fuzzy controller on a 2nd/3rd order system.

12. To control the pressure of Hydraulic System.

13. To control the pressure of Pneumatic System.

14. To study vector control of induction motor.

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC-CS-AIDS-408LA | Project-II | 0:0:12 | 12 | 6 | 0 | 100 | 100 | 200 | 3 |

| S. No. | Course No. | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC-CS-AIDS-410LA | General Fitness | 0:0:0 | 0 | 0 | 0 | 0 | 100 | 100 | 3 |

**B.Tech Computer Science and Engineering (Cyber Security)**
**Modified Scheme of Studies/Examination(w.e.f. Session 2023-24)**
**Semester VII**

| S. No. | Course No. | Subject | L: T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC-CS-CYS-401A | Cyber Attacks- OWASP Framework | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | HSS-403A | Universal Human Values II: Understanding Harmony | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | OEC | OEC Elective -II | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PE-I | Elective*-I | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 |
| 5 | PE-II | Elective* - II | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 |
| 6 | PC-CS-CYS-405LA | Cyber Attacks- OWASP Framework Lab | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |
| 7 | PC-CS-CYS-407LA | Cloud Security Lab | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |
| 8 | PC-CS-CYS-409LA | Project-I | 0:0:10 | 10 | 5 | 0 | 100 | 100 | 200 | 3 |
| 9 | PC-CS-CYS-413LA | Industrial Training | 0:0:0 | 0 | 3 | 0 | 100 | 0 | 100 | |
| | | **Total** | | **27** | **23** | **375** | **405** | **220** | **1000** | |

| Code | PE-I | Code | PE-II |
|---|---|---|---|
| PE-CS-CYS- 415A | Introduction to cyber laws | PE-CS-CYS-421A | Software Testing |
| PE-CS-CYS-417A | Advance Computer Architecture | PE-CS-CYS-423A | Cybercrime Forensics and Digital Forensics |
| PE-CS-CYS-419A | Software Vulnerability Analysis | PE-CS-CYS-425A | Cloud Security |

| Code | OEC Elective-II |
|---|---|
| OE-CS-CYS -401 | Robotics and Intelligent Systems |
| OE-CS-CYS-403 | Ethical Hacking |
| OE-CS- CYS-405 | Privacy and Security in IoT |
| OE-CS-CYS-407 | Digital Electronics |
| OE-CS-CYS-409 | Network Management and Security |

**Note:**
***The students will choose any two departmental Electives courses and One Open Elective course out of the given elective list in VII Semester.**

****Project should be initiated in the beginning of 7th semester, and should be completed by the end of 7th semester with good Report and power-point Presentation etc.**

*****4-6 weeks hand on training completed after 6th Semester Exams.**

| PC-CS-CYS-401A | Cyber Attacks- OWASP Framework | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | To understand web application security course based on OWASP Top 10 web application security risks. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Awareness about OWASP Top 10 web application security risks. | | | | | | |
| **CO2** | Understanding of the most critical security risks to web applications. | | | | | | |
| **CO3** | Identify and mitigate the ten most critical security risks by reviewing vulnerable source code. | | | | | | |
| **CO4** | Understand the need of writing the secure code. | | | | | | |

**Unit- I**

Getting Started with OWASP, Application Security Risks, OWASP Top 10 Application Security Risks, Introduction to Web Application Security (OWASP A02:2021 Cryptographic Failures, OWASP A04:2021—Insecure Design).

**Unit-II**

User Authentication (OWASP A07:2021—Identification and Authentication Failures, OWASP A03:2021—Injection, OWASP A02:2021—Cryptographic Failures), Function and Data Access Control (OWASP A01:2021—Broken Access Control).

**Unit-III**

SQL Injection (OWASP A03:2021—Injection), Cross-Site Scripting (XSS) (OWASP A08:2021—Software and Data Integrity Failures), Handling Data from an Untrusted Source (OWASP A09:2021—Security Logging and Monitoring Failures, A10:2021—Server-Side Request Forgery).

**Unit-IV**

Processing of Composite Data (OWASP A08:2021—Software and Data Integrity Failures), Configuration Errors (OWASP A05:2021—Security Misconfiguration, A06:2021— Vulnerable and Outdated Components).

Miscellaneous topics: Cross Site Request Forgery (CSRF), JWT security, session hijacking, Local File Inclusion (LFI), Remote File Inclusion (RFI).

**Suggested Books:**


- OWASP. Top 10 the Most Critical Web Application Security Risks. 2021. Available online: https://owasp.org/Top10/ (accessed on 15 January 2023).
- Troiano, Ernesto, Maurizio Ferraris, and John Soldatos. "Security challenges for the critical infrastructures of the financial sector." Cyber-physical threat intelligence for critical infrastructures security (2020).

| HSS-403A | Universal Human Values II: Understanding Harmony | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **MinorTest** | **Total** | **Time** |
| **3** | **0** | **0** | **3.0** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | Purposeandmotivationforthecourse,recapitulationfromUniversalHumanValues-I | | | | | | |
| **CourseOutcomes(CO)** | | | | | | | |
| **CO1** | Developmentofaholisticperspectivebasedonself-explorationabout | | | | | | |
| **CO2** | | | | | | | |
| **CO3** | Strengtheningofself-reflection. | | | | | | |
| **CO4** | Developmentofcommitmentandcouragetoact. | | | | | | |

**Module1:CourseIntroduction-Need,BasicGuidelines, ContentandProcessforValueEducation**

1. Purposeandmotivationforthecourse,recapitulationfromUniversalHumanValues-I
2. Self-Exploration–what isit? - Its content and process;'Natural Acceptance' andExperiential Validation-as the process forself-exploration
3. ContinuousHappinessandProsperity- AlookatbasicHumanAspirations
4. Rightunderstanding,RelationshipandPhysicalFacility- thebasicrequirementsforfulfilmentofaspirationsofeveryhumanbeingwiththeircorrectpriority
5. UnderstandingHappinessandProsperitycorrectly-Acriticalappraisalofthecurrentscenario
6. Methodtofulfiltheabovehumanaspirations:understandingandlivinginharmonyatvariouslevels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance forlivingwithresponsibility(livinginrelationship,harmonyandco-existence)ratherthanasarbitrarinessinchoicebasedonliking-disliking

**Module2:UnderstandingHarmonyintheHumanBeing-HarmonyinMyself!**

1. Understandinghumanbeingasaco-existenceofthesentient'I'andthematerial'Body'
2. UnderstandingtheneedsofSelf('I') and 'Body'-happinessandphysicalfacility
3. UnderstandingtheBodyasaninstrumentof'I'(Ibeingthedoer,seer andenjoyer)
4. Understandingthecharacteristicsandactivitiesof'I'andharmonyin'I'
5. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs,meaningofProsperityindetail
6. Programstoensure SanyamandHealth.

Include practice sessions to discuss the role others have played in making material goods available tome. Identifying from one's own life. Differentiate between prosperity and accumulation. Discussprogramforensuringhealthvs dealingwithdisease

**Module 3: Understanding Harmony in the Family and Society- Harmony in Human-HumanRelationship**

1. Understanding values in human-human relationship; meaning of Justice (nine universal values inrelationships)andprogramforitsfulfilmenttoensuremutualhappiness;TrustandRespectasthefoundationalvaluesofrelationship

2. UnderstandingthemeaningofTrust;Differencebetweenintentionandcompetence
3. Understanding the meaning of Respect, Difference between respect and differentiation; the othersalientvaluesinrelationship
4. Understanding theharmony inthesociety(societybeinganextensionoffamily): Resolution,Prosperity,fearlessness(trust)and co-existence ascomprehensive Human Goals
5. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- fromfamilytoworldfamily.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family,reallifeexamples,teacher-studentrelationship,goalofeducationetc.Gratitudeasauniversalvalueinrelationships.Discusswithscenarios.Elicitexamplesfromstudents'lives

**Module4:UnderstandingHarmonyintheNatureandExistence-WholeexistenceasCoexistence**

1. Understandingtheharmony intheNature
2. Interconnectednessandmutualfulfilmentamongthefourordersofnature- recyclabilityandself-regulationinnature
3. UnderstandingExistenceasCo-existenceof mutuallyinteractingunitsinall-pervasivespace
4. Holisticperceptionofharmonyatalllevels ofexistence.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" canbeused),pollution,depletionofresources androle oftechnologyetc.

**Module5: ImplicationsoftheaboveHolisticUnderstandingofHarmonyonProfessionalEthics**

1. Naturalacceptance ofhumanvalues
2. Definitiveness ofEthicalHumanConduct
3. BasisforHumanisticEducation,HumanisticConstitutionandHumanisticUniversalOrder
4. Competenceinprofessionalethics:a.Abilitytoutilizetheprofessionalcompetenceforaugmentin g universal human order b. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems, c. Ability toidentify and develop appropriatetechnologiesandmanagementpatternsforabove productionsystems.
5. Casestudiesoftypicalholistictechnologies,managementmodelsandproductionsystems
6. Strategy for transition from the presentstate to Universal Human Order: a.At the level ofindividual: as socially and ecologically responsible engineers, technologists and managers b. Atthe levelofsociety:asmutuallyenrichinginstitutionsandorganizations
7. Sumup.

IncludepracticeExercisesandCaseStudieswillbetakenupinPractice(tutorial)Sessionseg.todiscusstheconductas anengineerorscientistetc.

**READINGS:**

**TextBook**

1. HumanValuesand ProfessionalEthicsbyRRGaur,RSangal,GP Bagaria,ExcelBooks,New Delhi,2010

**ReferenceBooks**


1. JeevanVidya:EkParichaya, ANagaraj, JeevanVidyaPrakashan, Amarkantak,1999.
2. HumanValues,A.N.Tripathi,NewAgeIntl.Publishers,NewDelhi,2004.
3. TheStoryofStuff(Book).
4. TheStoryofMyExperimentswithTruth-byMohandas KaramchandGandhi
5. SmallisBeautiful-E.FSchumacher.
6. SlowisBeautiful-CecileAndrews
7. EconomyofPermanence-JCKumarappa
8. BharatMeinAngrejiRaj-PanditSunderlal
9. RediscoveringIndia -byDharampal
10. HindSwarajor IndianHomeRule-byMohandas K.Gandhi
11. IndiaWinsFreedom-MaulanaAbdulKalamAzad
12. Vivekananda-RomainRolland(English)
13. Gandhi-RomainRolland(English)


**MODEOFCONDUCT**

Lecture hours are to be used for lecture/practice sessions.

Lectureshoursaretobeusedforinteractivediscussion, placingtheproposalsaboutthetopicsathandandmotivatingstudents toreflect,explore andverifythem.

Practicehoursaretobeusedforpracticesessions.

Whileanalysinganddiscussingthetopic,thefacultymentor'sroleisinpointingtoessentialelementsto help in sorting them out from the surface elements. In other words, help the students explore theimportantorcriticalelements.

In the discussions, particularly during practice sessions, the mentor encourages the studentto connect with one's own self and do self-observation, self-reflection and self-exploration. Scenariosmay be used to initiate discussion. The student is encouraged to take up" ordinary" situations ratherthan" extra-ordinary" situations. Such observations and their analyses are shared and discussed withotherstudents andfacultymentor,inagroupsitting.

Practice experiments are important for the course. The difference is that the laboratoryis everyday life, and practical are how you behave and work in real life. Depending on the nature oftopics, worksheets, home assignment and/or activity are included. The practice sessionswould also provide support to a student in performing actions commensurate to his/her beliefs. It isintendedthatthiswouldleadtodevelopmentofcommitment,namelybehavingandworkingbasedonb asichuman values.

It is recommended that this content be placed before the student as it is, in the form of a basicfoundation course, without including anything else or excluding any part of this content. Additionalcontentmaybe offeredinseparate,highercourses.

Thiscourseistobetaughtbyfacultyfromeveryteachingdepartment,includingHSSfaculty.Teacherprepar ationwithaminimumexposuretoatleastone8-dayFDPonUniversalHumanValuesisdeemedessential.

**ASSESSMENT:**

This is a compulsory credit course. The assessment is to provide a fair state of development of thestudent, so participation in classroom discussions, self-assessment, peer assessment etc. will be usedinevaluation.

Example:

Assessmentby
facultymentor:5 marks
Self-assessment:5 marks
Assessmentbypeers:5 marks
Sociallyrelevantproject/GroupActivities/Assignments:10 marks
SemesterEndExamination: 75marks
Theoverallpasspercentageis40%. Incasethestudentfails,he/shemustrepeatthecourse.

| OE-CS-CYS-401 | Robotics and Intelligent Systems | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3** |
| **Purpose** | To impart understanding of the main abstractions and reasoning for Robotics and Intelligent Systems | | | | | | |
| **Course Outcomes (COs)** | | | | | | | |
| **CO1** | Understand the basic terminologies in Robotics to develop intelligent systems | | | | | | |
| **CO2** | Apply the random search and heuristic search for intelligent systems. | | | | | | |
| **CO3** | Understand the abstractions and reasoning for intelligent systems | | | | | | |
| **CO4** | Apply the rule-based methods in intelligent systems | | | | | | |
| **CO5** | Identify the characteristics and architectures of algorithms of multi agent systems | | | | | | |
| **CO6** | Identify different application areas of Intelligent Systems | | | | | | |

**UNIT-I**

**Introduction** to robotics- History, growth; Robot applications- Manufacturing industry, defense, rehabilitation, medical, Robot mechanisms, type of robots and use of robots in different area.

**UNIT-II**

Degree of freedom, classification and specifications of Robots, controller, actuator and drives. Sensors in robot – Touch Sensors-Tactile sensor – Proximity and range sensors. Force sensor-Light sensors, Pressure sensors, Introduction to Machine Vision and Artificial Intelligence.

U**NIT-III**

**Intelligent Systems:** Knowledge acquisition, Computational intelligence, Rule-based systems, Forward-chaining (a data-driven strategy), Conflict resolution, Backward chaining (a goal-driven strategy), Sources of uncertainty, Bayesian updating, Certainty theory.

**UNIT-IV**

**Possibility theory:** fuzzy sets and fuzzy logic, Object-oriented systems, Data abstraction, Inheritance, Encapsulation, Unified Modeling Language (UML), Dynamic (or late) binding. **Key Application Areas:** Expert System, Decision Support Systems, **Deep Learning:** Speech and vision, natural Language processing, Information Retrieval, Semantic Web.

**SUGGESTED BOOKS:**

1. Artificial Intelligence RB Mishra, PHI
2. Introduction to Artificial Intelligence, Charnaik, Pearson.
3. Artificial Intelligence by Elaine Rich, Kevin Knight and Shivashankar B Nair, Tata McGraw Hill.

4. Introduction to Artificial Intelligence and Expert Systems by Dan W Patterson, Pearson Education.
5. Artificial Intelligence : Building Intelligent Systems, KULKARNI, Parag , REPRINT, PHI.
6. CrinaGrosan, Ajith Abraham, “Intelligent Systems: A Modern Approach “,Springer-Verlag, 2011
7. Bogdan M. Wilamowski, J. David Irwin, “The Industrial Electronics Handbook. Second Edition: Intelligent Systems”, CRC Press, 2011
8. Abraham-Kandel, Gideon-Langholz, “Hybrid-Architectures for Intelligent Systems”, CRC-Press, 1992
9. Augmented Human, PAPAGIANNIS, Helen ,ist print, SPD.

10. Ian Goodfellow, YoshuaBengio and Aaron Courville, "Deep Learning", MIT Press, http://www.deeplearningbook.org

| OE-CS-CYS-403 | Ethical Hacking | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | The course teaches beginners about computer systems with the permission of the organization. People who have a keen interest in the field of technology can opt for this course. Ethical hacking is a process wherein professionals use the vulnerabilities of a network/ system to detect intrusions from malicious hackers. | | | | | | |
| | **Course Outcomes** | | | | | | |
| **CO 1** | To gain knowledge about Ethical hacking and penetration testing. | | | | | | |
| **CO 2** | To learn about various types of attacks, attackers and security threats and vulnerabilities present in the computer system. | | | | | | |
| **CO 3** | To examine how social engineering can be done by attacker to gain access of useful & sensitive information about the confidential data. | | | | | | |
| **CO 4** | To learn about cryptography, and basics of web application attacks. | | | | | | |

**Unit-I** Ethical Hacking: Introduction, Networking & Basics, Foot Printing, Google Hacking, Scanning, Windows Hacking, Linux Hacking, Trojans & Backdoors, Virus & Worms.

**Unit-II** Security operations center(SOC), SOC framework, SOC tools, what is QRadar, Incident Detection and Investigation with QRadar, Incident Responder process.

**Unit-III**Wifi hacking, firewall and honeypots, Snort introduction, Snort implementation, pentration testing, hacking web server, SQL injection, exploit writing in python, Format string

**Unit-IV** Reverse Engineering, Email Hacking, Incident Handling & Response, Bluetooth Hacking, Mobile Phone Hacking Basic ethical hacking tools and usage of these tools in a professional environment. Legal, professional and ethical issues likely to face the domain of ethical hacking. Ethical responsibilities, professional integrity and making appropriate use of the tools and techniques associated with ethical hacking.

**Suggested Books:**

Hacking: The Art of Exploitation, Jon Erickson, 2nd edition, No Starch Press
The Basics of Hacking and Penetration Testing, Patrick Engebretson, 2nd edition, Syngress
The Web Application Hacker's Handbook, DafyddStuttard, 2nd edition, Wiley

| OE-CS-CYS-405 | Privacy and Security in IoT | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | ToexplorethePrivacyPreservationandTrustModelsinInternetofThings(IoT) | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Identifytheareasof cybersecurityforthe InternetofThings. | | | | | | |
| **CO2** | Assessdifferent InternetofThingstechnologiesandtheirapplications. | | | | | | |
| **CO3** | Customizerealtimedata forIoTapplications. | | | | | | |
| **CO4** | Solve IoTsecurityproblems usinglightweightcryptography. | | | | | | |

## UNIT I

**IntroductiontoIoT –CyberPhysicalSystems:** IoT and cyber-physical systems, IoT security (vulnerabilities, attacks, and countermeasures), security engineering for IoT development, IoT security lifecycle.
**IoT as Interconnection of Threats:** Network Robustness of Internet of Things-Sybil Attack Detection in Vehicular Networks-Malware Propagation and Control in Internet of Things-Solution-Based Analysis of Attack Vectors on Smart HomeSystems

## UNIT II

**Crypto Foundations**: Block ciphers,message integrity,authenticated encryption, hash functions,Merkle trees, elliptic curves, public-key crypto (PKI), signature algorithms

**Privacy Preservation for IoT**: Privacy Preservation Data Dissemination- Privacy Preservation Data Dissemination- Social Features forLocationPrivacyEnhancementinInternetof Vehicles-Lightweight and Robust Schemes for Privacy Protection in Key Personal IoT Applications:Mobile WBSN and Participatory Sensing

## UNIT III

**Trust Models for IoT**: Authentication in IoT- Computational Security for the IoT- Privacy-Preserving Time Series Data Aggregation-Secure Path Generation Scheme for Real-Time Green Internet of Things-Security Protocols for IoT Access Networks- Framework for Privacy and Trust in IoT- Policy-Based Approach for Informed ConsentinInternet of Things.

## UNIT IV

**Internet of Things Security**: Security and Impact of the Internet of Things(IoT) on Mobile Networks-Networking Function Security-IoT Networking Protocols, Secure IoT Lower Layers,Secure IoT Higher Layers, Secure Communication Links in IoTs, Back-end Security-Secure Resource Management, Secure IoT Databases, Security Products-Existing Test bed on Security and Privacy of IoTs, Commercialized Products.

Text Books:

1. Hu, Fei. Security and privacy in Internet of things (IoTs): Models, Algorithms, and Implementations, 1st edition, CRCPress, 2016.
2. Russell,Brian,andDrewVanDuren.Practical InternetofThingsSecurity,1st edition,PacktPublishingLtd,2016.

REFERENCES:

1. WhitehouseO.Securityofthings:Animplementers' guidetocyber-securityforinternetof thingsdevicesand beyond,1st edition,NCC Group, 2014
2. DaCosta,Francis,and ByronHenderson.Rethinkingthe InternetofThings:ascalable approachtoconnectingeverything,1st edition, Springer Nature, 2013.

| **Code:** OE-CS-CYS-407 | **Digital Electronics** | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | Understanding the different number systems used in computerized system and codes used to represent the digits and fundamental of arithmetic operation using each number system and codes. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Verify and analyze the input/output data of each logic gate and circuits such as adders, counters, coders, etc. | | | | | | |
| **CO2** | Analyse the basic operation of memory cell and its limitations in circuit designing. | | | | | | |
| **CO3** | Apply the digital circuit design concept in developing basic component of computer organization, projects or experiments. | | | | | | |
| **CO4** | Learn synchronous and asynchronous modes of machines | | | | | | |

**Unit-I**

**Number System and Boolean Algebra**

Review of number system; types and conversion, codes. Boolean algebra: De-Morgan's theorem, switching functions, Prime Implicants and Essential Prime Implicants definition and simplification using K-maps up to 5 variables & Quine McCluskey method.

**Unit-II**

**Combinational Circuits**

Introduction to Logic Gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR and their combinations. Design of adder, subtractors, comparators, code converters, encoders, decoders, multiplexers and de-multiplexers, Function realization using gates & multiplexers.

**Unit-III**

**Synchronous Sequential Circuits**

Introduction to Latches and Flip flops – SR, D, JK and T. Design of synchronous sequential circuits – Counters, shift registers. Finite State Machine Design, Mealy, Moore Machines, Analysis of synchronous sequential circuits; state diagram; state reduction; state assignment with examples

**UNIT – IV**

**Asynchronous Sequential Circuits**

Analysis of asynchronous sequential machines, state assignment, asynchronous design problem**, Memories and Logic Families:**

Memories: ROM, RAM, PROM, EPROM, Cache Memories, PLA, PLD, FPGA, digital logic families: TTL, ECL, CMOS.

**Reference Books:**

Mano, Morris. "Digital logic." *Computer Design. Englewood Cliffs Prentice-Hall* (1979).
Kumar, A. Anand. *Fundamentals Of Digital Circuits 2Nd Ed.* PHI Learning Pvt. Ltd., 2009.
Taub, Herbert, and Donald L. Schilling. *Digital integrated electronics*. New York: McGraw-Hill, 1977.

| OE-CS-CYS-409 | Network Management and Security | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | To enable students to learn the various security standards set by the global industry. The various security applications that are used by industry. | | | | | | |
| | **Course Outcomes** | | | | | | |
| **CO 1** | Discuss the basic concepts of network security and various cryptographic algorithms. | | | | | | |
| **CO 2** | Describe how wireless security provided to information | | | | | | |
| **CO 3** | Discuss the Network Management Policy | | | | | | |
| **CO 4** | Discuss security and law along with Internet Governance and Email policy. | | | | | | |

**Unit-I**. Analysis of Goals: Analyzing business & technical goals Characterizing a Network, Network Topology & Addressing, Hierarchical Networks, Redundant Topologies, Designing Campus and Enterprise Topologies, Network layer addressing, Protocols & Physical Design, Switching Protocols, Routing Protocols , Cable Technologies , Device Selection

**Unit-II**: Remote Access & WAN topologies, LAN technologies, LAN design Principles, PPP, Modem, DSL access, SONET, Frame Relay. ATM, WAN design Principles, Network Management I SNMP MIB

**Unit-III**

Email privacy: Pretty Good Privacy (PGP) and S/MIME.IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

**Unit-IV**

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats. Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

**Suggested Books:**

Jianguo Ding, Advances in Network Management, Auerbach Publication, 2009, ISBN-10: 1420064525, ISBN-13: 978-1420064520 (available on-line)
Alexander Clemm, Network Management Fundamentals, Cisco Press (2007), ISBN 1-58720-137-2
P. Oppenheimer: Top Down Network Design 3rd edition and J Richard Burke
Network Management: Concepts and Practice, A Hands on Approach.

| PE-CS-CYS-415A | Introduction to cyber laws | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | The course deals with all the aspects of Cyber law as per Indian/IT act. It also covers overview of Cyber Ethics, Intellectual Property Right and Trademark Related laws with respect to Cyber Space. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | To give overview of Cyber Ethics, Intellectual Property Right and Trademark Related laws with respect to Cyber Space. | | | | | | |
| **CO 2** | To analyze and evaluate existing legal framework and laws on cyber security. | | | | | | |
| **CO 3** | To analyze and evaluate the Intellectual rights and copyrights. | | | | | | |
| **CO 4** | To understand cyber ethics. | | | | | | |
| | | | | | | | |

**Unit-1**

**Introduction to Cybercrime and cyber law**: Cyber Crimes Categories and kinds, Evolution of the IT Act, IT Act, 2000, various authorities under IT Act and their powers. Penalties & Offences, amendments

**Unit-2**

**Jurisdiction and Ecommerce:** Case Laws on Cyber Space Jurisdiction and Jurisdiction issues under IT Act, E – commerce and Laws in India, Digital / Electronic Signature in Indian Laws.

**Unit-3**

**Intellectual rights and copyrights**: Intellectual Property Rights, Domain Names and Trademark Disputes, Copyright in Computer Programmes, Concept of Patent Right, Sensitive Personal Data or Information in Cyber Law, Cyber Law an International Perspective.

**Unit-4**

**Cyber Ethics**: Cyber Ethics and Code, Net Neutrality, Free speech and Censorship in Cyberspace, Intellectual Property in Cyberspace, Privacy Rights and Surveillance.

**Suggested Books:**

1. Sushma Arora, Raman Arora, Cyber Crimes & Laws, 4th Edition 2021, Publisher: Taxmann, ISBN-10: 9390712491
2. N S Nappinai, Technology Laws Decoded, 1st Edition, Publisher: Lexis Nexis, ISBN: 9789350359723
3. Suresh T. Vishwanathan, The Indian Cyber Law, Bharat Law House New Delhi
4. P.M. Bukshi and R.K. Suri, Guide to Cyber and E –Commerce Laws, Bharat Law House, New Delhi
5. Rodney D. Ryder, Guide to Cyber Laws; Wadhwa and Company, Nagpur

**Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.**

| PE-CS-CYS-417A | Advance Computer Architecture | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To enable students to learn various computational models, design paradigms of advanced computer architecture, parallelism approaches and techniques for static and dynamic interconnections. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Classify and interpret various paradigms, models and micro-architectural design of advanced computer architecture as well as identify the parallel processing types and levels for achieving optimum scheduling | | | | | | |
| **CO2** | Identify the roles of VLIW & superscalar processors and branch handling techniques for performance improvement | | | | | | |
| **CO3** | Analyze and interpret the basic usage of various MIMD architectures and relative importance of various types of static and dynamic connection networks for realizing efficient networks. | | | | | | |
| **CO4** | Examine the various types of processors and memory hierarchy levels and cache coherence problem including software and hardware-based protocols to achieve better speed and uniformity. | | | | | | |

**Unit-I**

Computational Model: Basic computational models, evolution and interpretation of computer architecture, concept of computer architecture as a multilevel hierarchical framework, classification of parallel architectures, Relationships between programming languages and parallel architectures. Parallel Processing: Types and levels of parallelism, Instruction Level Parallel (ILP) processors, dependencies between instructions, principle and general structure of pipelines, performance measures of pipeline, pipelined processing of integer, Boolean, load and store instructions, VLIW architecture, Code Scheduling for ILP Processors - Basic block scheduling, loop scheduling, global scheduling.

**Unit-II**

Superscalar Processors: Emergence of superscalar processors, Tasks of superscalar processing – parallel decoding, superscalar instruction issue, shelving, register renaming, parallel execution, preserving sequential consistency of instruction execution and exception processing, comparison of VLIW & superscalar processors. Branch Handling: Branch problem, Approaches to branch handling – delayed branching, branch detection and prediction schemes, branch penalties, multiway branches, guarded execution.

**Unit-III**

MIMD Architectures: Concepts of distributed and shared memory MIMD architectures, UMA, NUMA, CCNUMA & COMA models, problems of scalable computers. Static connection networks: Linear array, ring, chordal ring, barrel shifter, star, tree, mesh and torus, fat Tree, systolic array, barrel shifter, hypercubes and Cube connected cycles. Dynamic interconnection networks: single shared buses, comparison of bandwidths of locked, pended & split transaction buses, arbiter logics, crossbar networks, multistage networks, omega networks, butterfly.

**UNIT – IV**

Processors and Memory Hierarchy: Advanced processor technology, memory hierarchy technology and virtual memory technology. Cache Coherence and Synchronization Mechanisms: Cache coherence problems, hardware based protocols – snoopy cache protocols, directory schemes, hierarchical cache coherence protocols, software based protocols.

**Reference Books:**

1. D.Sima, T.Fountain, P.Kasuk, Advanced Computer Architecture-A Design Space Approach, Pearson Education.
2. Kai Hwang and NareshJotwani, Advanced Computer Architecture-Parallelism, Scalability, Programmability, McGraw Hill.
3. M.J. Quinn, Parallel Computing: Theory and Practice, Second Edition, McGraw Hill.
4. J. L. Hennessy and D. A. Patterson, Computer Architecture: A Quantitative approach, Morgan Kaufmann/Elsevier.
5. T.G. Lewis and H. EI- Rewini, Introduction to parallel computing, Prentice Hall.
6. Nicolas Carter, Computer Architecture, McGraw Hill.

| PE-CS-CYS-419A | Software Vulnerability Analysis | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | Identification and quantification of security weaknesses, primarily in source code and executables. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Explain computer security problem and identify why broken software lies at its heart. | | | | | | |
| **CO2** | Develop and apply software validation and verification techniques to test security vulnerabilities. | | | | | | |
| **CO3** | Develop case studies to think like an attacker to expose security vulnerabilities in software systems. | | | | | | |
| **CO4** | Relate security testing and verification to risk analysis to address continued resilience when a cyber-attack takes place. | | | | | | |

**Unit- I**

Classic security goals (confidentiality, integrity, etc.), Threats and threat exposure, Vulnerability categories, Audit overview, Design reviews, Fundamental design flaws, Threat modeling.

**Unit-II**

Review/Audit process, Audit strategies, Memory corruption: buffer overflows, heap overflows, global and static data, shellcode, protection mechanisms.

**Unit-III**

C/C++ language issues, Expression evaluation, Type conversions, Common mistakes, String handling issues, String encodings, Metacharacter handling and injection issues, String functions, Hex encoding.

**Unit-IV**

Auditing techniques for source code and binary analysis, Hardware vulnerabilities (Specter, Meltdown, etc.)

**Suggested Books:**

- Computer Security: Art and Science, 2nd edition. Matt Bishop. Addison-Wesley, 2019, ISBN-13: 978-0-321-71233-2.

| PE-CS-CYS-421A | Software Testing | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hrs.** |
| **Purpose** | **To provide an understanding of concepts and techniques for testing software and assuring its quality.** | | | | | | |
| | **Course Outcomes** | | | | | | |
| **CO 1** | Expose the criteria and parameters for the generation of test cases. | | | | | | |
| **CO 2** | Learn the design of test cases and generating test cases. | | | | | | |
| **CO 3** | Be familiar with test management and software testing activities and V&V activities. | | | | | | |
| **CO 4** | Be exposed to the significance of software testing in web and Object orient techniques. | | | | | | |

**Unit-I**

**Introduction:** Overview of software evolution, SDLC, Testing Process, Terminologies in Testing: Error, Fault, Failure, Verification, Validation, Difference between Verification and Validation, Definition of software testing, test cases, test oracles, testing process, limitations of testing.

**Unit-II**

**Functional Testing:** Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique.

**Structural Testing:** Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing.

**Unit-III**

**Reducing the number of test cases:** Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing and Slice based testing.

**Testing Activities:** Unit Testing, Levels of Testing, Integration Testing, System Testing, Debugging, Domain Testing.

**Unit-IV**

**Overview of SQM:** Concepts of Software Quality, quality attributes, software quality models: McCall, Boehm, ISO-9000, CMM.

**Misellaneous Topics:** Stress testing, Adhoc testing, Buddy testing, Exploratory testing, Agile and extreme testing.

**Suggested Books:**


- Naresh Chauhan, “Softearw Testing Principles and Practices” Oxford publications, 2012.
- William Perry, “Effective Methods for Software Testing”, John Wiley & Sons, New York, 1995.
- CemKaner, Jack Falk, Nguyen Quoc, “Testing Computer Software”, Second Edition, Van Nostrand Reinhold, New York, 1993.
- Boris Beizer, “Software Testing Techniques”, Second Volume, Second Edition, Van Nostrand Reinhold, New York, 1990.
- Louise Tamres, “Software Testing”, Pearson Education Asia, 2002
- Roger S. Pressman, “Software Engineering – A Practitioner’s Approach”, Fifth Edition, McGraw-Hill International Edition, New Delhi, 2001.
- Boris Beizer, “Black-Box Testing – Techniques for Functional Testing of Software and Systems”, John Wiley & Sons Inc., New York, 1995.
- K.K. Aggarwal & Yogesh Singh, “Software Engineering”, New Age International Publishers, New Delhi, 2003.
- Marc Roper, “Software Testing”, McGraw-Hill Book Co., London, 1994.

| PE-CS-CYS-423A | Cybercrime Forensics and Digital Forensics | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | Understanding of digital logic, operating system concepts, Computer hardware knowledge. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | Describe Forensic science and Digital Forensic concepts | | | | | | |
| **CO 2** | Understand of preliminaries operating systems and their artefacts. | | | | | | |
| **CO 3** | Interpret the cyber pieces of evidence, Digital forensic process model and their legal perspective. | | | | | | |
| **CO 4** | Demonstrate various forensic tools to investigate the cybercrime and to identify the digital pieces of evidence | | | | | | |

**Unit-1**

**Introduction:** Introduction to Digital Forensics, Definition and types of cybercrimes, Computer virus, and computer worm, Trojan horse, trap door, super zapping, logic, social media crimes, intellectual property crimes, cyber pornography& child pornography, cyber terrorism, hate speech and cyber security, hacking and cracking, credit card and ATM frauds, web technology, cryptography, emerging digital crimes and modules.

**OS System and Artifacts:** Definition and Cardinal Rules, Windows Systems and Artifacts: Introduction, Windows File Systems, New Technology File System, File System Summary, Registry, Event Logs, Prefetch Files, Shortcut Files, Windows Executables.

**Unit-II**

**Linux Systems and Artifacts**: Introduction, Linux File Systems, File System Layer, File Name Layer , Metadata Layer, Data Unit Layer, Journal Tools, Deleted Data, Linux Logical Volume Manager, Linux Boot Process and Services, Linux System Organization and Artifacts, Partitioning, File system Hierarchy, Ownership and Permissions, File Attributes, Hidden Files, User Accounts , Home Directories, Shell History, Logs, User Activity Logs, Syslog, Command Line Log Processing, Scheduling Tasks.

**Unit-III**

**Digital Forensics Process Model:** The digital forensic process, Locard's exchange principle, Scientific models, Introduction to cybercrime scene, Documenting the scene and evidence, maintaining the chain of custody, forensic cloning of evidence, Live and dead system forensic, hashing concepts to maintain the integrity of evidence, legal issues.

**Unit-IV**

**Forensic Tools and Processing of Electronic Evidence:** Evaluating Computer Forensics Tool Needs, Types of Computer Forensics Tools, Tasks Performed by Computer Forensics Tools, Computer Forensics Software Tools, Command-Line Forensics Tools, UNIX/Linux Forensics Tools, finding deleted data, hibernating files, examining window registry, recycle bin operation, understanding of metadata, Restore points and shadow copies. Case Studies: Understanding of Internet resources, Web browser, Email header forensic, social networking sites

**Text and Reference Books:**

1. C. Altheide& H. Carvey Digital Forensics with Open-Source Tools, Syngress

2. Bill Nelson, Amelia Phillips, Christopher Steuart, “Guide to Computer Forensics and Investigations”, Fourth Edition

3. www.nptel.com

| PE-CS-CYS-425A | **Cloud Security** | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To enable students to learn various computational models, design paradigms of advanced computer architecture, parallelism approaches and techniques for static and dynamic interconnections. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Classify and interpret various paradigms, models and micro-architectural design of advanced computer architecture as well as identify the parallel processing types and levels for achieving optimum scheduling | | | | | | |
| **CO2** | Identify the roles of VLIW & superscalar processors and branch handling techniques for performance improvement | | | | | | |
| **CO3** | Analyze and interpret the basic usage of various MIMD architectures and relative importance of various types of static and dynamic connection networks for realizing efficient networks. | | | | | | |
| **CO4** | Examine the various types of processors and memory hierarchy levels and cache coherence problem including software and hardware-based protocols to achieve better speed and uniformity. | | | | | | |

**Unit - 1**

Introduction to AWS Security by Design, AWS Key Management Best Practices, A Deep Dive into AWS Encryption Services, Security at Scale: Logging in AWS, AWS WAF, AWS Security Incident Response.

**Unit - 2**

Common attacks on cloud infrastructure: Unauthorized Access, SQL injection, XSS, Misconfiguration, DOS - DDOS, Data Loss/Leakage, Data Privacy/Confidentiality, Incident Response, counter measure to protect cloud infrastructure.

**Unit - 3**

Data Protection for Cloud Infrastructure and Services: Understand the Cloud based Information Life Cycle, Data protection for Confidentiality and Integrity, Data protection laws of India, Common attack vectors and threats, Data Protection Strategies.

**Unit - 4**

Monitoring, Auditing and Management: Proactive activity monitoring, Incident Response, Monitoring for unauthorized access, malicious traffic, abuse of system privileges, intrusion detection, events and alerts.

Reference books

Securing The Cloud: Cloud Computing Security Techniques and Tactics by Vic (J.R.) Winkler (Syngress/Elsevier) - 978-1-59749-592-9 o

Cloud Computing Design Patterns by Thomas Erl (Prentice Hall) - 978-0133858563

| PC-CS-CYS-405 LA | Cyber Attacks- OWASP Framework Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hours** |
| **Purpose** | Understand the OWASP Top 10 and how to use them to minimize risk. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Apply the OWASP Top 10 to ensure your applications minimize the security risks in the list. | | | | | | |
| **CO2** | Explore how Web Applications are built and delivered on top of the HTTP protocol. | | | | | | |
| **CO3** | Explore threat agents, attack vectors, and impact of the ten most critical web application security risks. | | | | | | |
| **CO4** | Explore common exploitation techniques used to test software security. | | | | | | |

LIST OF PRACTICALS*:*

1. **Lab1: Introduction to Web Application Security-** In this lab, there is creation of an environment for testing the security of WWW applications and for performing basic tasks such as data preview and modification of the transmitted HTTP requests. Virtual laboratories in this topic are based on OWASP A02:2021—Cryptographic Failures and OWASP A04:2021—Insecure Design. The exercises involved in this lab are-- Response Headers Preview (*), Manipulating HTTP Parameters (*), Launch and Configuration of Proxy in a browser (**), Automatic Application Scan (*), Modification of HTTP Requests (*), Repeating HTTP Request (*), Finding the Right Parameter Value by Brute Force Method (**).
2. **Lab2: User Authentication-** This topic concerns authentication-related attacks. Authentication describes the procedure to verify one's identity. On most websites, it is encountered in the form of a username and password combination that is needed to log in. Session management, on the other hand, comes into play when we are successfully authenticated. Upon login, a unique session key is generated. This unique key ensures that our logged-in session is held upright as we browse the application, so we do not have to re-authenticate each time we switch the endpoint. Broken authentication denotes that there is an issue with the authentication or the way that the session is handled. In this module, students can detect broken authentication using manual methods and can exploit them using automated tools with password lists and dictionary attacks. They can examine and compromise session tokens. Virtual laboratories in this topic are based on OWASP A07:2021—Identification and Authentication Failures, OWASP A03:2021—Injection, and OWASP A02:2021—Cryptographic Failure and consist of five exercises, which are described as: Low-Complexity User Password (**), Weak Randomness Session Identifier (**), Client-Side Authentication (*), Incorrect password reset implementation (**), User Enumeration Based on Response Time (**).
3. **Lab3: Function and Data Access Control-** In this module, students are introduced to the weaknesses and vulnerabilities available in broken access control. Access control, also known as authorization (not to be confused with authentication), is a process that determines whether users can gain access to a resource. Authorization is a basic security service that appears in most applications. Decisions regarding access control are generally enforced on the basis of rules (called policies) set down by the user. Virtual laboratories in this topic are based on OWASP A01:2021—Broken Access Control and consist of the five exercises described in detail below as: Access to Hidden Pages (**), Security Flaw in Access to API (**), HTTP Parameter Manipulation (**), Path Traversal Vulnerability (**), Insecure Direct Object Reference Vulnerability (**).

4. **Lab4: SQL Injection**- Injection attacks are discussed in the OWASP injection module. According to the OWASP authors, injection flaws are very prevalent and are often found in SQL, LDAP, XPath, or NoSQL queries, OS commands, XML parsers, SMTP headers, expression languages, and ORM queries. They can be easily discovered using automated tools such as scanners and fuzzers. In the exercises prepared for this topic, we mostly focused on SQL-based attacks. SQL injection is an attack that inserts (injects) a malicious part of an SQL query to a database in a loaded request that is created by an application. Virtual laboratories in this topic are based on OWASP A03:2021-Injection and consist of the five exercises described in detail below as: Classic SQL Injection Vulnerability (*), Reading the Database Schema (**), Identification of the Database Server Version (**), Blind SQL Injection Vulnerability (***), Time-Based SQL Injection Vulnerability (***).

5. **Lab5: Cross-Site Scripting (XSS)**-According to OWASP, cross-site scripting (XSS) attacks can be found in around two-thirds of all web applications. Cross-site scripting (XSS) attacks are a type of attack involving injection, where malicious input data (such JavaScripts) are inserted in the HTML code of WWW pages. There are three forms of XSS, usually targeting users' browsers: reflected XSS (injecting code to the HTTP request), stored XSS (injecting code into a data source that provides data for the page), and DOM XSS (used when an application uses JavaScript to dynamically create the page content). Virtual laboratories in this topic are based on OWASP A08:2021—Software and Data Integrity Failures and consist of the seven exercises described in detail below as: Stored XSS Vulnerability (*), Reflected XSS Vulnerability (*), DOM XSS Vulnerability (*), XSS Vulnerability (Other Vector) (**), XSS Vulnerability (Filtering Out Tags) (**), XSS Vulnerability (Improved Tag Filtering) (**), XSS Vulnerability (Input Validation) (***).

6. **Lab6: Handling Data from an Untrusted Source**-- Data coming from external sources (such as data entered by application users) cannot be recognized by the application as trusted; the application should verify their correctness (e.g., format). One of the most common web application security vulnerabilities is an incorrect check of the correctness of the input data from a client or environment. Data that are modified or prepared unexpectedly can be used for application logic abuse attacks, denial of service (a DoS type of attack), or execution of any code after deserialization of the data. In this section, students learn about common security gaps that emerge from incorrect or unimplemented data validation mechanisms. Virtual laboratories in this topic are based on OWASP A09:2021—Security Logging and Monitoring Failures and OWASP A10:2021—Server-Side Request Forgery and consist of 10 exercises as described in detail below as: Reading an Unexpected File (*), Reading an Unexpected File with the Use of PHP Filters (**), Running a Malicious Command by Uploading a File (**), Secure File Upload (***), Remote Reading of an Unexpected File (**), Standard Web Application Firewall (WAF) (***), Protected Files Download (WAF) (****), Insecure Log Browser (*), Secure Log Browser (****), Sending E-mails (****).

7. **Lab7: Processing of Composite Data—** XML external entities (XXE) attacks can cause denial of service, file scans, and remote code execution that undermine the security of the system. Understanding the relationship between XML files, parsing, and weak parsing is imperative to understanding what an XXE attack is and why such an attack can put the system at risk. Virtual laboratories in this topic are based on OWASP A08:2021—Software and Data Integrity Failures and consist of the six exercises described in detail below as: Unprotected Parsing of XML Files (*), Denial-of-Service Attack with the Use of an XML Bomb (*), Unprotected Object Deserialization (*), Protected Parsing of XML Files (**), From Deserialization of the Object to Code Execution on the Server (***), Real Attack on the Framework Using Object Deserialization (****).

8. **Lab8: Configuration Errors--** Security misconfiguration vulnerabilities can occur when a web application component is susceptible to attack due to misconfiguration or an insecure configuration option. Virtual laboratories in this topic are based on OWASPA05:2021—Security Misconfiguration and OWASP A06:2021—Vulnerable and Outdated Components and consist of the six exercises described in detail below as: Publicly Accessible Administration Panel (**), Insecure Database Server Configuration (**), Publicly Accessible Development Server (**), Using Default Passwords (**), Outdated Software with Known Vulnerabilities (**), Publicly Available Backup (**).

9. **Lab9: Cross Site Request Forgery (CSRF)--** The objective of this lab is to help students understand the Cross-Site Request Forgery (CSRF) attack. A CSRF attack involves a victim user, a trusted site, and a malicious site. The victim user holds an active session with a trusted site while visiting a malicious site. The malicious site injects an HTTP request for the trusted site into the victim user session, causing damages.

10. **Lab10: JWT security and session hijacking**

11. **Lab11: Local File Inclusion (LFI) and Remote File Inclusion (RFI).**

**Lab Practical Resources:**


1. Ksiezopolski, Bogdan, et al. "Teaching a Hands-On CTF-Based Web Application Security Course." *Electronics* 11.21 (2022): 3517.
2. Cross Site Request Forgery (CSRF), Available online: https://seedsecuritylabs.org/Labs_16.04/PDF/Web_CSRF_Elgg.pdf (accessed on 15 January 2023).


**NOTE:** A student must perform at least ten experiments. Seven experiments should be performed from the above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

| PC-CS-CYS-407LA | Cloud Security Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hours** |
| **Purpose** | Understand the cloud deployment and security tools | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Learn various cloud deployment tools | | | | | | |
| **CO2** | Learn about Cloud security metrics. | | | | | | |
| **CO3** | Explore threat in cloud services & application. | | | | | | |
| **CO4** | To get the knowledge about work with cloud management Platform | | | | | | |

**LIST OF PRACTICALS**

1. **Installation and configuration of Microsoft Azure/AWS/Cloud Stack environment**

2. **Implement Service deployment & Usage over cloud.**

3. **Perform Management actions of cloud resources and prepare report.**

4. **Using existing cloud characteristics & Service models deploy various services.**

5. **Perform Cloud Security Management Operations**

6. **Performance evaluation of services over cloud.**

**B. Tech Computer Science and Engineering (Cyber Security)**
**Modified Scheme of Studies/Examination (w.e.f. Session 2023-24)**
**Semester VIII**

| S. No. | Course No. | Subject | L: T:P | Hours/ Week | Credits | Examination Schedule | | | | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | PC-CS- CYS-402A | Block Chain in Cyber security | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | HSS-404A | Entrepreneurship and Start-ups | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | OEC | OEC Elective*-III | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PE-III | Elective*-III | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 |
| 5 | PE-IV | Elective* - IV | 2:0:0 | 2 | 2 | 75 | 25 | 0 | 100 | 3 |
| 6 | PC-CS- CYS-406LA | Cyber security Block Chain Lab | 0:0:2 | 2 | 1 | 0 | 40 | 60 | 100 | 3 |
| 7 | PC-CS- CYS-410LA | Project-II | 0:0:10 | 10 | 5 | 0 | 100 | 100 | 200 | 3 |
| 8 | PC-CS- CYS-412LA | General Fitness & Professional Aptitude | 0:0:0 | 0 | 0 | 0 | 0 | 100 | 100 | 3 |
| | | **Total** | | **25** | **19** | **375** | **265** | **260** | **900** | |

| Code | PE Elective* -III | Code | PE Elective* -IV |
|---|---|---|---|
| PE-CS- CYS- 414A | Penetration Testing | PE-CS- CYS- 422A | Intrusion detection and Prevention |
| PE-CS- CYS- 416A | Identity and Access Management | PE-CS- CYS- 424A | Introduction to Cyber Crime Investigations |
| PE-CS- CYS- 420A | Biometric Security | PE-CS- CYS- 426A | Social Networks |

| Code | OEC Elective*-III |
|---|---|
| OE-CS- CYS-402 | Backup Disaster & Recovery |
| OE-CS- CYS-404 | Cryptographic Fundamentals |
| OE-CS- CYS-406 | Artificial Intelligence |
| OE-CS- CYS-408 | Reasoning, Problem Solving and Robotics |
| OE-CS- CYS-410 | Data Injection |

***Note:***
****The students will choose any two departmental Electives courses and One Open Elective course out of the given elective list in VIII Semester.***

*****Project should be initiated in the beginning of 8$^{th}$ semester, and should be completed by the end of 8$^{th}$ semester with good Report and power-point Presentation etc.***

| PC-CS-CYS-402A | Block Chain in Cyber Security | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 hrs** |
| **Purpose** | ***Purpose To provide knowledge of various* Blockchain *& Cyber Security*** | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| CO 1 | *To learn the basics of Blockchain Concepts & Architecture.* | | | | | | |
| CO 2 | *To explore knowledge of various process of Cyber attacks on blockchain* | | | | | | |
| CO 3 | To understand the basics of security issues | | | | | | |
| CO 4 | To implies the basic of solidity and its deployment | | | | | | |

**UNIT I-** Blockchain and Smart Contract Fundamentals: Introduction to Blockchain, Importance of Blockchain, need of Blockchain, types of blockchain, Decision Tree, Consensus Mechanism

**Cryptography, Hashing, and Digital Signatures:** Introduction, Hashing, Hash Function Characteristics, Digital Signatures, Data Encryption, Denial of Serviceman-in-The-Middle Attack, System Resiliency, Infrastructure Hardening.

**Unit II-Consensus Protocols:** Proof of Work, Security Issues in Proof of Work, Proof of Stake, Security Issues in Proof of Stake, Other Consensus Types

**Blockchain Vulnerabilities and Attacks**: Network and Consensus Security Issues, Smart Contract and Code Security Issues, Wallet and Client Security Issues, Centralization Security Issues, User Security Issues.

***Unit-III -Cyber security for Blockchain***: *Introduction, CIA Triad, AAA of Security, Non-repudiation, Risk Measurement, Blockchain Governance, Quantum Computing, Smart Contracts.*

**Unit-IV-Solidity:** Solidity Language Overview, Storage, Memory, and Call Data, Function Selectors, Interacting with EVM Smart Contracts, Compiling and Deploying Contracts

**Smart Contract Security Issues**: Security Hacks on Ethereum, Common Vulnerabilities and Attacks, Case Study: The DAO Hack, Case Study: The Poly-Network Hack.

*Suggested Books:*

1) Ashutosh Saxena “Blockchain Technology: Concepts and Applications”
2) Makoto Yano “Blockchain and Crypto Currency
3) Anand Shinde “Introduction to Cyber Security”

| HSS-404A | Entrepreneurship and Start-ups | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To expose students to the joys and skills of being an entrepreneur. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | To understand the basics of Entrepreneurship. | | | | | | |
| **CO2** | To learn the basics of Creative and Design Thinking. | | | | | | |
| **CO3** | To apply the Business Enterprises. | | | | | | |
| **CO4** | To know about business models. | | | | | | |

**Unit I**

Introduction to Entrepreneurship, Meaning and concept of entrepreneurship, the history of entrepreneurship development, role of entrepreneurship in economic development, Myths about entrepreneurs, types of entrepreneurs.

**Unit II**

The skills/ traits required to be an entrepreneur, Creative and Design Thinking, the entrepreneurial decision process, entrepreneurial success stories.

**Unit III**

Crafting business models and Lean Start-ups: Introduction to business models; Creating value propositions-conventional industry logic, value innovation logic; customer focused innovation; building and analysing business models; Business model canvas, Introduction to lean start-ups, Business Pitching.

**Unit IV**

Institutions Supporting Small Business Enterprises: Central level institutions. State level institutions. Other agencies. Industry Associations. Class exercise- discussions on current government schemes supporting entrepreneurship and finding out which scheme will most

suit the business plan devised by the student.

**Text Books:**


- Kuratko, D , Hornsby J.S. (2017) New Venture Management: Entrepreneur's roadmap
- Hisrich, R.D., Manimala, M.J., Peters, M.P., Shepherd, D.A.: Entrepreneurship, Tata McGraw Hill
- Ries, Eric(2011)The lean Start-up: How constant innovation creates radically
- S. Carter and D. Jones-Evans (2012), Enterprise and small business- Principal Practice and Policy, Pearson Education (2006)

| OE-CS-CYS-402 | Backup Disaster & Recovery | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | Understanding of business continuity and disaster recovery principles. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Strong understanding of business continuity and disaster recovery principles, including conducting business impact analysis, assessing risks, developing policies and procedures, and implementing a plan. | | | | | | |
| **CO2** | Learn to secure data by putting policies and procedures in place, and how to recover and restore their organizations critical data in the aftermath of a disaster. | | | | | | |
| **CO3** | Learn to implement Data Recovery techniques. | | | | | | |

**Unit- I**

**Introduction to Disaster Recovery and Business Continuity:** Overview of Disaster Recovery and Business Continuity, Trends in Disaster Recovery and Business Continuity, Understanding Best Practices in Disaster Recovery and Business Continuity, Overview of Business Continuity Management (BCM), Understanding Best Practices and Standards of BCM.

**Risk Assessment:** Overview of Risk and its Terminology, Understanding Risk Assessment Process, Understanding Best Practices and Standards in Risk Management.

**Unit-II**

**Business Impact Analysis and Business Continuity Plan:** Overview of Cost Benefit Analysis (CBA) and Business Impact Analysis (BIA), Understanding Standards of BIA, Understanding How to Perform BIA, Overview of Business Continuity Plan (BCP), Overview of Business Continuity Strategy Design.

**Data Backup Strategies:** Overview of Data Backup, Understanding RAID Technology, Overview of SAN and NAS, Understanding Types of Data Backup, Understanding Cloud Data and Disaster Recovery, Overview of Infrastructure Technologies, Understanding Data Protection Continuum and Best Practices in Backup.

**Unit-III**

**Data Recovery Strategies:** Overview of Data Recovery, Understanding Data Recovery Process and Best Practices, Understanding Virtualization-Based Disaster Recovery, Understanding Best Practices and Standards in Virtualization, Understanding System Recovery, Overview of Centralized and Decentralized Computing, Overview of Centralized Backup, Data Consolidation, and Survivable Storage Systems.

**Unit-IV**

**Disaster Recovery Planning Process:** Overview of Disaster Recovery Planning, Understanding Disaster Recovery Planning Process and Methodology.

**BCP Testing, Maintenance, and Training:** Overview of Business Continuity Plan Testing, Maintaining and Auditing the Business Continuity Plan, Overview of BCP Training Program.

**Suggested Books:**


- EC-COUNCIL DISASTER RECOVERY PROFESSIONAL. Available online: https://www.eccouncil.org/programs/business-continuity-and-disaster-recovery-training/ (accessed on 16 January 2023).
- Chakraborty, Bapi, and Yashajeet Chowdhury. Introducing Disaster Recovery with Microsoft Azure. Apress, 2020.

| OE-CS-CYS-404 | Cryptographic Fundamentals | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | To Understand various cryptographic algorithm, public-key cryptosystem, and fundamental ideas of public-key cryptography. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Student will be able to understand basic cryptographic algorithms. | | | | | | |
| **CO2** | Able to understand the fundamental ideas of public-key cryptography. | | | | | | |
| **CO3** | Analyze and compare symmetric-key encryption public-key encryption schemes based on different security models | | | | | | |
| **CO4** | Able to understand the PKI infrastructure. | | | | | | |

**Unit-I**

**Cryptography Concept**: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks Historical Ciphers, Computational Security, Semantic Security, Pseudorandom Generators (PRGs) PRF, PRP and SPRP.

**Unit-II**

**Symmetric key Ciphers:** Block Cipher principles, Modes of Operations of Block Ciphers, DES, AES, Stream ciphers.

**Cryptographic Hash Functions:** MAC, Information-theoretic Secure MAC, Cryptographic Hash Functions, Birthday Attacks on Cryptographic Hash Functions, Applications of Hash Functions, Generic Constructions of Authenticated Encryption Schemes.

**Unit-III**

**Asymmetric key Ciphers:** Discrete-Logarithm Problem, Computational Diffie-Hellman Problem, Decisional Diffie-Hellman Problem, Elliptic-Curve Based Cryptography and Public-Key Encryption, El Gamal Encryption Scheme, RSA Assumption, CCA -secure Public-key Hybrid Ciphers Based on Diffie-Hellman Problems and RSA-assumption, Digital Signatures.

**Unit-IV**

**Key Management and Distribution:** Symmetric Key Distribution Using Symmetric & Asymmetric Encryption, Distribution of Public Keys, Kerberos, X.509 Authentication Service, Public – Key Infrastructure, overview of SSL/TLS.

**Suggested Books:**

1. Cryptography and Network Security: Forouzan Mukhopadhyay, Mc Graw Hill, 3rd Edition.
2. Katz and Y. Lindell, Introduction to Modern Cryptography, CRC press, 2020.
3. Cryptography and Network Security - Principles and Practice: William Stallings, Pearson Education, 6th Edition

| OE-CS-CYS-406 | Artificial Intelligence | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | The course provides grounding in basic and advanced methods to big data technology and tools. | | | | | | |
| **Course Outcomes –** | | | | | | | |
| **CO1** | Understand the basics of the theory and practice of Artificial Intelligence as a discipline and about intelligent agents. | | | | | | |
| **CO2** | Understand search techniques and gaming theory. | | | | | | |
| **CO3** | The student will learn to apply knowledge representation techniques and problem-solving strategies to common AI applications. | | | | | | |
| **CO4** | Student should be aware of techniques used for classification and clustering. Student should be aware of basics of pattern recognition and steps required for it. | | | | | | |

**Unit I-**INTRODUCTION: Introduction–Definition – Future of Artificial Intelligence – Characteristics of Intelligent Agents– Typical Intelligent Agents – Problem Solving Approach to Typical AI problems.

**Unit II-**PROBLEM-SOLVING METHODS Problem-solving Methods – Search Strategies- Uninformed – Informed – Heuristics – Local Search Algorithms and Optimization Problems – Searching with Partial Observations – Constraint Satisfaction Problems – Constraint Propagation – Backtracking Search – Game Playing – Optimal Decisions in Games – Alpha – Beta Pruning – Stochastic Games

**Unit III-** KNOWLEDGE REPRESENTATION First Order Predicate Logic – Prolog Programming – Unification – Forward Chaining-Backward Chaining – Resolution – Knowledge Representation – Ontological Engineering-Categories and Objects – Events – Mental Events and Mental Objects – Reasoning Systems for Categories – Reasoning with Default Information

**Unit IV-**SOFTWARE AGENTS Architecture for Intelligent Agents – Agent communication – Negotiation and Bargaining – Argumentation among Agents – Trust and Reputation in Multi-agent systems. APPLICATIONS AI applications – Language Models – Information Retrieval- Information Extraction – Natural Language Processing – Machine Translation – Speech Recognition – Robot – Hardware – Perception – Planning – Moving

**Text books:**

1. S. Russell and P. Norvig, “Artificial Intelligence: A Modern Approach‖, Prentice Hall, Third Edition, 2009.
2. I. Bratko, ―Prolog: Programming for Artificial Intelligence‖, Fourth edition, Addison-Wesley Educational Publishers Inc., 2011.
3. M. Tim Jones, ―Artificial Intelligence: A Systems Approach(Computer Science)‖, Jones and Bartlett Publishers, Inc.; First Edition, 2008
4. Nils J. Nilsson, ―The Quest for Artificial Intelligence‖, Cambridge University Press, 2009.

5. William F. Clocksin and Christopher S. Mellish, ‖ Programming in Prolog: Using the ISO Standard‖, Fifth Edition, Springer, 2003.
6. Gerhard Weiss, ―Multi Agent Systems‖, Second Edition, MIT Press, 2013.
7. David L. Poole and Alan K. Mackworth, ―Artificial Intelligence: Foundations of Computational Agents‖, Cambridge University Press, 2010.

| OE-CS- CYS-408 | Reasoning, Problem Solving and Robotics | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | This subject provides the basic knowledge about the knowledge representation and robotics | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Understanding of identity governance and data governance. | | | | | | |
| **CO2** | Understanding of backward reasoning and search methods. | | | | | | |
| **CO3** | Understanding of basics of robotics and actuating system. | | | | | | |
| **CO4** | Application and understanding of sensors and robotic controls. | | | | | | |

**UNIT-1-** Solving problems by reasoning: Definition and Importance of Knowledge, Knowledge-Based Systems, And Representation of Knowledge, Knowledge Organization, Knowledge Manipulation, And Acquisition of Knowledge, The reasoning algorithm, Conflict resolution, Explanation of the reasoning. Forward reasoning: The method of forward reasoning, A simple case study of forward reasoning.

**UNIT-II-**Backward reasoning: Solving problems by reduction, The method of backward reasoning, A simple case study of backward reasoning, Bidirectional reasoning. Search Methods: Depth-first search, Breadth-first search, Hill climbing search, A* search. Contradiction freeness: The notion of contradiction freeness, Testing contradiction freeness, The search problem of contradiction freeness. Completeness: The notion of completeness, Testing completeness, The search problem of completeness. Decomposition of knowledge bases: Strict decomposition, Heuristic decomposition.

**UNIT-III-**Introduction to Robotics: Classification, Components, Characteristics, Applications. Robotics Kinematics, Position Analysis, Robots as Mechanisms, Matrix Representation, Transformation Matrices, Forward and Inverse Kinematics. Actuators: Characteristics of Actuating Systems, Actuating Devices and Control, Use of Reduction Gears, Comparison Of Hydraulic, Electric, Pneumatic Actuators, Hydraulic Actuators.

**UNIT-IV-**Sensors: Sensor Characteristics, Description of Different Sensors, Vision Sensors, Force Sensors, Proximity Sensors, Tilt Sensors.

Robot Controls: Point to Point Control, Continuous Path Control, Intelligent Robot, Control System for Robot Joint, Control Actions, Feedback Devices.

**Suggested Books**:


1. Intelligent Systems and Control: Principles and Applications Paperback – 12 Nov 2009 by Laxmidhar Behera, Indrani Kar by OXFORD.
2. Intelligent Systems and Technologies Methods and Applications by Springer publications.
3. Intelligent Systems - Modeling, Optimization and Control, by Yung C. Shin and Chengying Xu, CRC Press, Taylor & Francis Group, 2009.
4. Saeed B. Niku, Introduction to Robotics Analysis, Application, Pearson Education Asia, 2001.
5. S.R. Deb, Robotics Technology and flexible automation, Tata McGraw-Hill Education., 2009.
6. Fu. K. S., Gonzalez. R. C. & Lee C.S.G., "Robotics control, sensing, vision and intelligence", McGraw Hill Book co, 1987.
7. Craig. J. J. "Introduction to Robotics mechanics and control", Addison- Wesley, 1999.

| OE-CS-CYS-410 | Data Injection | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To understand the basic concept of data injection and role of data injection in cyber security | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Understand the basic concept of data injection | | | | | | |
| **CO2** | Understand various concept of SQL that are fundamental to data injection | | | | | | |
| **CO3** | Study of Injection vulnerabilities against hacking and web attacks | | | | | | |
| **CO4** | Explore some introductory concepts data injection in different field | | | | | | |

**UNIT I**-Introduction to data injection, Cyber security, Cyber-attack, Cyber Warfare and cyber terrorism, types of web attacks, Privacy attack, SQL Injection Attacks, web attack forensics, Injection vulnerabilities

**UNIT II**-Type of Injection SQL Injection, Blind Injection Detection, Cross-Site Scripting, Broken Authentication & Session Management, Insecure Direct Object References, Failure to Restrict URL, Remote Code Execution.

**UNIT III**-Hacking Web Applications & SQL Injection: Hacking Web Servers, Types of Web Server Vulnerabilities, Attacks against Web Servers, IIS Unicode Exploits, Patch Management Techniques, Web Server Hardening Methods Web Application Vulnerabilities, Objectives of Web Application Hacking.

**UNIT IV**-SQL Injection and Buffer Overflows: SQL Injection, Steps to Conduct SQL Injection, SQL Server Vulnerabilities, Countermeasures Buffer Overflows, Types of Buffer Overflows and Methods of Detection, Stack-Based Buffer Overflows, Buffer Overflow Mutation Techniques.

**Reference Books:**


1. SQL Injection Attacks and Defense, 2nd Edition by Justin Clarke, Syngress.
2. SQL Injection Strategies by Ettore Galluccio, Edoardo Caselli, Gabriele Lombari.
3. SQL Hacks by Andrew Cumming, Gordon Russell
4. The Art of Invisibility by Kevin Mitnick.

| PE-CS-CYS-414A | Penetration Testing | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To enable students to learn various computational models, design paradigms of advanced computer architecture, parallelism approaches and techniques for static and dynamic interconnections. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Classify and interpret various paradigms, models and micro-architectural design of advanced computer architecture as well as identify the parallel processing types and levels for achieving optimum scheduling | | | | | | |
| **CO2** | Identify the roles of VLIW & superscalar processors and branch handling techniques for performance improvement | | | | | | |
| **CO3** | Analyze and interpret the basic usage of various MIMD architectures and relative importance of various types of static and dynamic connection networks for realizing efficient networks. | | | | | | |
| **CO4** | Examine the various types of processors and memory hierarchy levels and cache coherence problem including software and hardware-based protocols to achieve better speed and uniformity. | | | | | | |

***Unit I****- Penetration Testing phases/Testing Process, types and Techniques, Blue/Red Teaming, Strategies of Testing, Non-Disclosure Agreement Checklist, Phases of hacking, Open-source/proprietary Pentest Methodologies. Pentest Scoping: The mindset of the professional Pen Tester, creating effective pen test scopes and rules of engagement.*

***Unit -II****-Recon: Detailed Recon Using the Latest Tools, Mining Search Engine Results, google hacking database, shodan, Information gathering methodologies- Foot printing, Competitive Intelligence DNS Enumerations- Social Engineering attacks, Port Scanning- Network Scanning Vulnerability Scanning - NMAP scanning tool.*

***Unit -III*** *-System Hacking: Password cracking techniques - Key loggers - Escalating privileges - Hiding Files, Steganography technologies and its Countermeasures. Active and passive sniffing- ARP Poisoning, MAC Flooding. SQL Injection - Errorbased, Union-based, Time- based, Blind SQL, SQL Injection Prevention Techniques.*

***Unit – IV-****wireless pentest: Wi-Fi Authentication Modes, Bypassing wlan, wep, wps Authentication practically,Attacks on the WLAN Infrastructure, Wi-Fi deauthentication attack, Wireless Hacking Methodology, Wireless Traffic Analysis, packet capturing, aircrack-ng, capturing the handshake, cracking the handshake, Wifi hacking prevention,Legal Documentation and Report Writing: legal documents you may encounter as a penetration tester, Statements of Work, Rules of Engagement, Non-Disclosure Agreements, and Master Service Agreements.*

*Suggested Books:*

*The hacker playbook:-Practical guide to penetration testing Author: Kim ISBN -10: 149-4932636/ISBN-13: 978-1494932633*

| PE-CS- CYS- 416A | Identity and Access Management | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Understanding of fundamentals and frameworks of identity and access management | | | | | | |
| **CO2** | Application and usage of various authentication protocols | | | | | | |
| **CO3** | Study of Injection vulnerabilities against hacking and web attacks | | | | | | |
| **CO4** | Understanding of identity governance and data governance. | | | | | | |

## Unit-I

Identity and access management (IAM): framework, key principles, Capability maturity framework, Common challenges and key considerations: Governance, program delivery, sustain compliance, identity lifecycle, control access, operations. Identity and access intelligence, peer group, outlier analysis, role analysis, resource allocation and analysis, risk and fraud systems integration, kerberos, biometrics, Okta platform, security concepts: job rotation, least privileges, separation of duty.

Cloud based IAM, deployment models, service models, security and risk management. Access request, approval and provisioning: system overview, key components, data management, authentication, authentication implementation approaches, authorization, logging and monitoring, access review and certification process.

## Unit-II

LDAP: Basics, Configuration, Managing data, operational consideration. SAML: assertions, protocols, profiles, OAuth: roles, tokens, grants. OpenID connect, proxy: load balancing, access control and security, rate limiting, Caching and compression, telemetry, monetization, API v Web proxies, open-source web proxies. Strong Authentication: OTP, HOTP, TOTP, mutual SSL/TLS, FIDO, W3C web authentication and CTAP.

## Unit-III

Privileged Access Management (PAM), Privileged Account, Privileged Account Monitoring, PAM components: credential management, access management, session management, logging, security, reporting,

Application whitelisting. Types of access control models, RBAC model, access management life cycle, RBAC implementation considerations. Future of identity and access management

## Unit-IV

Identity Governance and Administration (IGA), User Onboarding, User Termination & Role changes, Access control models, Access validation & certification, Segregation of Duties, Auditing and Reporting, Identity lifecycle management, cross domain identity management.

Data Governance and Protection, data types, intellectual property, data classification, industry and local laws & regulations, Data type management & monitoring, security policy framework, data breach and incident response process, notifiable data breaches.

**Suggested Books:**


1. Identity and Access Management by Ertem Osmanoglu, Syngress, 2013.
2. Securing the Perimeter: Deploying identity and access management with free open source software by Michael Schwartz, Maciej Machulak, Apress, 2018.
3. Keycloak - Identity and Access Management for Modern Applications: Harness the power of Keycloak, OpenID Connect, and OAuth 2.0 protocols to secure applications by Stian thorgersen, Packt publishing ltd, 2021.
4. Focus on IAM (Identity and Access Management): CSFs, metrics, checklists, best practices, and guidelines for defining IAM processes and implementing IAM solutions by Kiran Kumar Pabbathi, ServiceManagers.org,2014.
5. Digital Identity and Access Management: Technologies and Frameworks (Premier Reference Source) 1st Edition by Raj Sharman, Sanjukta Das Smith, Manish Gupta.

| PE-CS-CYS-420A | Biometric Security | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To understand the physical security methods and mechanism. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Identify the various Biometric technologies. | | | | | | |
| **CO2** | Design of biometric recognition for the organization. | | | | | | |
| **CO3** | Develop simple applications for privacy. | | | | | | |
| **CO4** | Understand the need of biometric in the society | | | | | | |

**UNIT I** INTRODUCTION: Person Recognition – Biometric systems –Biometric functionalities: verification, identification – Biometric systems errors - The design cycle of biometric systems – Applications of Biometric systems – Security and privacy issues.

**UNIT II** FINGER PRINT AND FACIAL RECOGNITION: FINGERPRINT: Introduction – Friction ridge pattern- finger print acquisition: sensing techniques, image quality –Feature Extraction –matching – indexing. FACE RECOGNITION: Introduction –Image acquisition: 2D sensors ,3D sensors- Face detection- Feature extraction -matching.

**UNIT III** IRIS AND OTHER TRAITS: Design of an IRIS recognition system-IRIS segmentation-normalization – encoding and matching IRIS quality –performance evaluation –other traits- ear detection – ear recognition –gait feature extraction and matching –challenges- hand geometry –soft biometrics.

**UNIT IV** BEHAVIORAL BIOMETRICS: Introduction –Features- classification of behavioral biometrics – properties of behavioral biometrics – signature –keystroke dynamics –voice- merits –demerits –applications-error sources-types –open issues –future trends.

**UNIT V** APPLICATIONS AND TRENDS: Application areas: surveillance applications- personal applications –design and deployment -user system interaction-operational processes – architecture – application development –design validation-disaster recovery plan-maintenance-privacy concerns.

TEXT / REFERENCE BOOKS:

1. James wayman, Anil k. Jain ,Arun A. Ross ,Karthik Nandakumar, ―Introduction to Biometrics‖, Springer, 2011

2. John Vacca "Biometrics Technologies and Verification Systems" Elsevier 2007

3. James Wayman, Anil Jain, David Maltoni, DasioMaio(Eds) "Biometrics Systems Technology", Design and Performance Evalution. Springer

4. Khalid saeed with Marcin Adamski, Tapalina Bhattasali, Mohammed K. Nammous, Piotr panasiuk, mariusz Rybnik and Soharab H.Sgaikh, ―New Directions in Behavioral Biometrics, CRC Press

5. Paul Reid "Biometrics for Network Security "Person Education 2004

6. Shimon K. Modi, Biometrics in Identity Management :concepts to applications‖, Artech House 2011.

| PE-CS-CYS- 422A | Intrusion Detection and Prevention | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | To understand the intrusion detection and prevention technologies and various types of network behaviour analysis. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | To understand the intrusion detection and prevention technologies, various types of network behaviour analysis. | | | | | | |
| **CO 2** | To understand the honeypots, multiple IDS methods, tools to analyse various types of attacks like wireless attacks and their detection. | | | | | | |
| **CO 3** | To understand the attack source and provides practical knowledge for dealing with intrusions in real world applications. | | | | | | |

**Unit-1**

**Introduction to IDPS:** Introduction of Intrusion detection and Prevention Systems **(**IDPS), Components and Architecture Implementation, Uses of IDPS Technologies, Key Functions, Common Detection Methodologies-- Signature, Anomaly and Stateful Protocol Analysis, Types of IDPS Technologies.

**Host and Network IDPS:** Application, Transport, Network and Hardware Layer attacks, Sniffing Network Traffic, Replay Attacks, Command Injection, Internet Control Message Protocol Redirect, DDoS, Dangers and defences with Man-in the Middle, Secure Socket Layer attacks, DNS Spoofing, Defence- in-Depth Approach, Port Security, Use Encrypted Protocols.

**Unit-2**

**Network Behaviour Analysis:** Components and Architecture Typical, Network Architecture, Sensor Locations.
**Honeypots:** Honeynets- Gen I, II and III, Detecting the Attack - Intrusion Detection, Network Traffic Capture, Monitoring on the box, Setting up the Realistic Environment, OpenCanary, Cowrie honeypots deployment.

**Unit-3**

**Working with SNORT IDS:** Introduction to Snort, Snort Alert Modes and Format, Working with Snort Rules, Rule Headers, Rule Options, The Snort Configuration File etc, Plugins, Pre-processors and Output Modules, Using Snort with MySQL.

**Multiple IDPS Technologies:** Need for multiple IDPS Technologies, Integrating Different IDPS Technologies - Direct and Indirect, Firewalls, Routers and Honeypots, IPS using IP Trace back - Probabilistic and Deterministic Packet Marking, Marking.

**Unit-4**

**Wireless IDPS:** Exception WLAN Standards, WLAN Components, Threats against WLANs, 802.11 Wireless Infrastructure Attacks, WEP Attacks, Wireless Client Attacks, Bluetooth Attacks, Cell phones, Personal Digital Assistance and Other Hybrid Devices Attack Detection, Jailbreaking.

**Suggested Books:**


1. Shui Yu, Distributed Denial of Service Attack and Defense, Springer, 2014.
2. Bradd Lhotsky, OOSEC Host based Intrusion detection, PACKT Publication, 2013.
3. Sandeep Kumar Shukla, Manindra Agrawal, Cyber Security in India, Springer, 2020.


**Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.**

| PE-CS-CYS-424A | Introduction to Cyber Crime Investigations | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hours** |
| **Purpose** | 1. To learn the basics of cyber crime Investigations.<br>2. To learn about the different digital forensic systems and services<br>3. To learn about file recovery using various tools<br>4. To learn about processing the crime scene and preserving digital evidence | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | Describe what a digital investigation is, the sources of digital evidence, and the limitations of<br>Forensics. | | | | | | |
| **CO 2** | Describe the legal requirements for use of seized data. | | | | | | |
| **CO 3** | Conduct data collection on backup drives. | | | | | | |
| **CO 4** | Recover data based on a given search term from an imaged system. | | | | | | |

**Unit-I**

**Introduction:** Understanding the need of Computer Forensics, Definitions, **Computer Hardware:** Analysis of sources for digital evidence, Digital Media, Hard disk basics, mobile phones, **Forensic Tools:** Forensic hardware, Hardware write/blockers, Hard drive acquisitions, Processing the scene, **Files and File Systems:** Windows file systems, Forensic file images, metadata, File signatures.

**Unit-II**

**Forensic software:** Different software packages, Basic search queries, ASCII, UNICODE, Regular expressions, viewing and managing keywords and cases, Encryption, password protection, Password recovery tools, **Physical evidence**: fingerprints or other evidence on machines, keyboards, **Forensic Reports:** Proper report writing, Explaining forensics to the uneducated

**Unit–III**

**Email analysis:** IP tracking, Tracking and analysis of emails, Webmail, POP, IMAP, **File signature analysis:** File signatures, File extensions, detecting file manipulation, **Hash Analysis:** Hashing files, Hash libraries, **Window Artifacts:** My documents, recycle bin, Installed programs, Windows XP vs. Windows 7, **File Systems:** FAT/NTFS file Systems, Parsing FAT/NTFS file systems, Prefetch and SuperFetch, Shortcuts and Jumplists, **Adversary and Malware hunting:** Malware detection, Malware analysis

**Unit-IV**

**Memory Forensics:** Memory acquisition, Memory analysis, memory analysis tools, Advanced Recycle bin, Server Logs, google forensics, **Anti-Forensics Detection:** detection methodologies, Volume shadow copy, ESE databases, Advanced Registry, Thumbnail cache, **Computer crime and legal issues:** Privacy issues, Intellectual property, **Incident Response:** Threat and Adversary Intelligence, Financial crime analysis, **Live/Online Forensics:** Live Digital Forensics Investigation, **Tools:** BitTorrent, Sleuthkit toolset, Windows Forensics Toolchest

**Suggested Books:**


- Parasram, Shiva VN. Digital Forensics with Kali Linux: Perform data acquisition, data recovery, network forensics, and malware analysis with Kali Linux 2019. x. Packt Publishing Ltd, 2020.
- Bill Nelson, Amelia Philips, Christopher Steuart, Guide to Computer Forensics and Investigations, Fifth Edition, Cengage Learning,2016.
- Luttgens, Jason T., Matthew Pepe, and Kevin Mandia. Incident response & computer forensics. McGraw-Hill Education Group, 2014.


**Note: The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.**

| PE-CS-CYS- 426A | Social Networks | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **2** | **0** | **0** | **2** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | Students will be able to use social networks for business and personal use, conducting social network analysis, social network developer tools and social network concepts for solving real-world issues. | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO1** | Demonstrate proficiency in the use of social networks for business and personal use | | | | | | |
| **CO2** | Demonstrate proficiency in the use of social network analysis concepts and techniques. | | | | | | |
| **CO3** | Demonstrate proficiency in the use of social network developer tools. | | | | | | |
| **CO4** | Examine the various types of processors and demonstrate proficiency in the use of social network concepts for solving real world issues. | | | | | | |

## UNIT 1 INTRODUCTION

Introduction to Semantic Web: Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - Social Network analysis: Development of Social Network Analysis - Key concepts and measures in network analysis - Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities - Web-based networks - Applications of Social Network Analysis.

## UNIT 2 MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION

Ontology and their role in the Semantic Web: Ontology-based knowledge Representation - Ontology languages for the Semantic Web: Resource Description Framework - Web Ontology Language - Modeling and aggregating social network data: State-of-the-art in network data representation - Ontological representation of social individuals - Ontological representation of social relationships - Aggregating and reasoning with social network data - Advanced representations.

## UNIT 3 EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS

Extracting evolution of Web Community from a Series of Web Archive - Detecting communities in social networks - Definition of community - Evaluating communities - Methods for community detection and mining - Applications of community mining algorithms - Tools for detecting communities social network infrastructures and communities - Decentralized online social networks.

## UNIT 4 PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES

Understanding and predicting human behavior for social communities - User data management - Inference and Distribution - Enabling new human experiences - Reality mining - Context - Awareness - Privacy in online social networks - Trust in online environment - Trust models based on subjective logic - Trust network analysis.

**TEXT BOOKS:**

1. Peter Mika, Social Networks and the Semantic Web‖, First Edition, Springer 2007.
2. Borko Furht, Handbook of Social Network Technologies and Applications, 1st Edition, Springer, 2010.

**REFERENCES**

1. Guandong Xu ,Yanchun Zhang and Lin Li, Web Mining and Social Networking Techniques and applications‖, First Edition, Springer, 2011.
2. Dion Goh and Schubert Foo, Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively‖, IGI Global Snippet, 2008.

| PC-CS-CYS-406LA | Cyber Security Block Chain Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs.** |
| **Purpose** | To implement the concepts of Blockchain Network in Cyber security. | | | | | | |
| **Course Outcomes-Attend of the course students will be able to:** | | | | | | | |
| **CO1** | Implement solidity programming language. | | | | | | |
| **CO2** | Implement various process of blockchain network. | | | | | | |
| **CO3** | Implement meta mask to execute the smart contract. | | | | | | |
| **CO4** | Implement various type of smart contract and its deployment. | | | | | | |

**1)** Write a program in remix that calculate the prime number in solidity.

**2)** Write a program to implement various hash function used in cryptography Technique.

**3)** Deposit some Ether in your MetaMask accounts.

**4)** Create several accounts and make some transactions between these accounts on Rinkeby Network.

**5)** Test some properties of cryptographic hashing like small change in input results in big change in output.

**6)** Write a smart contract in remix that execute different data types in solidity.

**7)** Write a smart contract in remix that execute different Error handling functions in solidity.

**8)** Write a smart contract in remix that execute concept of inheritance in solidity.

**9)** Write a smart contract in remix that execute different loops in solidity.

**10)** Write a program in remix that execute different events in solidity.

# DEPARTMENT OF FOREIGN LANGUAGES

## KURUKSHETRA UNIVERSITY, KUSUKSHETRA

(Established by State Legislature Act XII of 1956)
(A + Grade, NAAC Accredited)

Syllabi and Scheme of Examination under Credit Based System of

**Advance Diploma in Japanese Language (Semesters I & II)**

To be implemented from the Session 2023-2024

Structure, Scheme of Examination, Credits and Teaching Hours of

Advance Diploma in Japanese Language (Semesters I & II)

### Semester-I

| Paper No. | Name of the course | No. of Credits | Teaching hours per week | Examination scheme (Marks) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Theory | Internal assessment | Total marks | Duration of the exam |
| FLADJ-101 | Japanese Scripts, vocabulary and Grammar-I | 3 | 3 | 50 | 50 | 100 | 3 Hours |
| FLADJ-102 | Translation and Essay-I | 3 | 3 | 50 | 50 | 100 | 3 Hours |
| **Total Credits, Hours per week and marks in Sem. I** | | **06** | **06** | **100** | **100** | **200** | -- |

### Semester-II

| Paper No. | Name of the course | No. of Credits | Teaching hours per week | Examination scheme (Marks) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Theory | Internal assessment | Total marks | Duration of the exam |
| FLADJ-201 | Japanese Scripts, vocabulary and Grammar-II | 3 | 3 | 50 | 50 | 100 | 3 Hours |
| FLADJ-202 | Translation and Essay-II | 3 | 3 | 50 | 50 | 100 | 3 Hours |
| **Total Credits, Hours per week and marks in Sem. II** | | **06** | **06** | **100** | **100** | **200** | **200** |

**Total Credits, Hours per week and Marks in Sem. I & II**

| Total Credits, Hours per week & Marks in Semester I & II | No. of Credits | Teaching hours per week | Theory | Internal assessment | Total marks |
|---|---|---|---|---|---|
| | **12** | **12** | **200** | **200** | **400** |

**Advance Diploma in Japanese Language**

Semester-I

Japanese Scripts, Vocabulary and Grammar-I

CODE: FLADJ-101

**Credits: 3**

**Theory: 50**
**Internal Assessment: 50**
**Max. Marks: 100**
**Time: 3 Hours**

(i) Study of Kanji.
(ii) Vocabulary and Grammar

**Prescribed Book** –

Chukyu Nihongo, Publisher -Japanese Language Education Center for International Students, Tokyo University of Foreign Studies—Chapters 01to 07

**Semester End Examination:**

| | | |
|---|---|---|
| (i) | Scripts | **20 marks** |
| (ii) | Vocabulary and Grammar | **30 marks** |

**Total Marks: 50**

**Internal Assessment:** Internal assessment will be based on the following criteria:

1. One class test will be held after two months of course. **20 marks**
2. Viva-voce examination (15+15 marks) will be held twice in a semester. First one will be conducted before the class test and the second one will be conducted before the End semester end examination. **30 marks**

**Total: 50 Marks**

## Advance Diploma in Japanese Language

Semester-I
Translation and Essay-I
CODE: FLADJ-102

**Credits: 3**

**Theory: 50**
**Internal Assessment: 50**
**Max. Marks: 100**
**Time: 3 Hours**

(i) Translation (English to Japanese and vice versa)
(ii) Essay writing

**Prescribed Book**

Chukyu Nihongo, Publisher -Japanese Language Education Center for International Students, Tokyo University of Foreign Studies—Chapters 01to 07

**Semester End Examination:**

| | | |
|---|---|---|
| **(i)** | Translations (English to Japanese 15 marks , Japanese to English 15 marks) | **30 Marks** |
| (ii) | Essay writing on pre-assigned topics | **20 Marks** |

**Total Marks: 50**

**Internal Assessment:** Internal assessment will be based on the following criteria:

1. One class test will be held after two months of course. **20 marks**

2. Two assignments (15+15 marks) will be taken twice in a semester. First one will be submitted before the class test and the second one will be submitted before the End semester end examination. **30 marks**

**Total: 50 Marks**

## Advance Diploma in Japanese Language

Semester-II
Japanese Scripts, vocabulary and Grammar-II
CODE: FALDJ-201

**Credits: 3**

**Theory: 50**
**Internal Assessment: 50**
**Max. Marks: 100**
**Time: 3 Hours**

(i) Study of scripts and Kanji.
(ii) Vocabulary and Grammar

**Prescribed Book** –
Chukyu Nihongo, Publisher -Japanese Language Education Center for International Students, Tokyo University of Foreign Studies—Chapters 08to 15

**Semester End Examination:**

| | |
|---|---|
| (i) Scripts | **20 marks** |
| (ii) Vocabulary and Grammar | **30 marks** |

**Total Marks: 50**

**Internal Assessment:** Internal assessment will be based on the following criteria:

1. One class test will be held after two months of course. **20 marks**
2. Viva-voce examination (15+15 marks) will be held twice in a semester. First one will be conducted before the class test and the second one will be conducted before the semester end examination. **30 marks**

**Total: 50 Marks**

## Advance Diploma in Japanese Language

Semester-II
Translation and Essay-II
CODE: FLADJ-202

**Credits: 3**

**Theory: 50**
**Internal Assessment: 50**
**Max. Marks: 100**
**Time: 3 Hours**

(i) Translation (English to Japanese and vice versa)
(ii) Essay writing

**Prescribed Book**

Chukyu Nihongo, Publisher -Japanese Language Education Center for International Students, Tokyo University of Foreign Studies—Chapters 08to 15

**Semester End Examination:**

| | | |
|---|---|---|
| (i) | Translations (English to Japanese 15marks, Japanese to English 15 marks) | **30 Marks** |
| (ii) | Essay writing on pre-assigned topics | **20 Marks** |

**Total Marks: 50**

**Internal Assessment:** Internal assessment will be based on the following criteria:

1. One class test will be held after two months of course. **20 marks**
2. Two assignments (5+5 marks) will be taken twice in a semester. First one will be submitted before the class test and the second one will be submitted before the semester end examination. **30 marks**

**Total: 50 Marks**

# CERTIFICATE PROGRAMME IN FRENCH

## 1. Programme Outcomes:

This programme aims at introducing the basics of the Foreign Language (French) and gradually build skills in Listening, Speaking, Reading, Writing and also enabling culture understanding. The programme will cater to the basic linguistic needs of a foreign students going to study/work in German/French/Japanese speaking nations.

## 2. Programme Objectives:

- Become competent in French A1 Level
- Master the basics of conversation in French language
- Learn the A1 grammar & vocabulary of French language
- Learn French pronunciation, speaking, writing along with correct comprehension.
- Learn about the French culture

## 3. Scheme of Examination: Certificate Programme in French w.e.f. session 2023-24 under CBS

| Paper No. | Name of the course | No. of Credits | Teaching Scheme (Total hours) | Examination scheme (Marks) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Theory | Internal assessment (2 Assignments)* | Total marks | Duration of the exam |
| CPF-101 | Communicative Grammar | 2 | 18 | 35 | 15 | 50 | 3 Hours |
| CPF-102 | Text Comprehension and Written Expression | 2 | 18 | 35 | 15 | 50 | |
| **Total Credits, Hours and marks** | | **04** | **36** | **70** | **30** | **100** | **--** |

**Note: only one examination will be held for both the courses**

*Assignments can be as MCQ's/Viva-Voce/Project Work.
** Duration of end term examination will be three hours.

## 4. Syllabus for Certificate Programme in French

**Course I- Communicative Grammar (Credit: 2)**

Basic elements of grammar as covered in the prescribed text book, such as:-

a) The French Alphabet
b) Numbers
c) Determinants
d) Prepositions
e) Conjugation Of Regular Verbs/ IrregularVerbs
f) Adjective possessive
g) Adjective demonstrative
h) Interrogative adjectives
i) Nouns(masculine and feminine)
j) Plurals
k) Adjectives
l) Contracted articles
m) Pronouns : COD,COI
n) Pronouns tonique (pronouns used after prepositions)
o) Pronoun en andy
p) Reflexive verbs
q) Relative pronouns
r) Present ,past, future, near future tense
s) Imperative and subjonctif
t) Interrogative adjectives
u) Quantitative articles

**Course II- Text Comprehension and Written Expression (Credits: 2)**

v) Dictations
w) Comprehension skills of The FrenchLanguage
x) The French PronunciationRules
y) French Vocabulary: Colours, Family, Body, Clothing, At home, Food & Beverages, Animals, Professions, Weather, Leisure Time Activities, Emotions & Adjectives, Countries & Nations,Means ofTransport.
z) A short essay on topics like My City, My University, My Family, AboutMyself.

## 5. Prescribed books:

*Certificate Programme in French*

Cosmopolite A1Textbook with DVD +Workbook (2 book set) Goyal Publishers

**Links for open resources will be shared with learners.*

# CERTIFICATE PROGRAMME IN GERMAN

## 1. Programme Outcomes:

This programme aims at introducing the basics of the Foreign Languages (German) and gradually build skills in Listening, Speaking, Reading, Writing and also enabling culture understanding. The programme will cater to the basic linguistic needs of a foreign students going to study/work in German/French/Japanese speaking nations.

## 2. Programme Objectives:

- Become competent in German A1Level
- Master the basics of conversation in German language
- Learn the A1 grammar & vocabulary of German language
- Learn German pronunciation, speaking, writing along with correct comprehension.
- Learn About the German culture

## 3. Scheme of Examination: Certificate Programme in German w.e.f. session 2023-24 under CBS

| Paper No. | Name of the course | No. of Credits | Teaching Scheme (Total hours) | Examination scheme (Marks) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Theory | Internal assessment (2 Assignments)* | Total marks | Duration of the exam |
| CPG-101 | Communicative Grammar *(Functional grammar based on the text book)* | 2 | 18 | 35 | 15 | 50 | 3 Hours |
| CPG-102 | Text Comprehension and Written Expression *(Comprehension of texts, Essays on simple topics, Question on Culture, Translation)* | 2 | 18 | 35 | 15 | 50 | |
| **Total Credits, Hours and marks** | | **04** | **36** | **70** | **30** | **100** | **--** |

**Note: only one examination will be held for both the courses**

* Assignments can be as MCQ's/Viva-Voce/Project Work.
** Duration of end term examination will be three hours.

4. Syllabus for Certificate Programme in German:

**Course 1- Communicative Grammar (Credit: 2)**

Basic elements of grammar as covered in the prescribed text book, such as:-

a) The German Alphabet
b) Numbers
c) The Nominative
d) German Gender Rules (der, die,das)
e) Conjugation Of Regular Verbs/ Irregular Verbs
f) W-Questions
g) Accusative
h) Modal Verbs
i) Noun/Plural
j) Compound Words
k) Negation
l) Conjunctions
m) Possessive Determiners

**Course 2- Text Comprehension and Written Expression (2 Credits)**

n) Comprehension skills Of The German Language
o) German Vocabulary: Colours, Family, Body, Clothing, At home, Food & Beverages, Animals, Professions, Weather, Leisure Time Activities, Emotions & Adjectives, Countries & Nations, Means of Transport.
p) A short essay on topics like My City, My University, My Family, About Myself.

**4. Prescribed books:**

*Certificate Programmein German:*
Netzwerk Deutsch als Fremdsprache A1 (Textbook + Workbook + Glossary) (with 2 CDs)Paper back (German, Goyal Publishers & Distributors Pvt Ltd).

**Links for open resources will be shared with learners..*

## CERTIFICATE PROGRAMME IN JAPANESE

### 1. Programme Outcomes:

This programme aims at introducing the basics of the Foreign Language (Japanese) and gradually build skills in Listening, Speaking, Reading, Writing and also enabling culture understanding. The programme will cater to the basic linguistic needs of a foreign students going to study/work in Japanese speaking nations.

### 2. Programme Objectives:

- Become competent in Japanese Beginners' Level
- Master the basics of conversation in Japanese language
- Learn the Beginners' grammar & vocabulary of Japanese language
- Learn Japanese pronunciation, speaking, script along with correct comprehension.
- Learn about the Japanese culture

### 3. Scheme of Examination Scheme : Certificate Programme in Japanese w.e.f. session 2023-24 under CBS

| Paper No. | Name of the course | No. of Credits | Teaching Scheme (Total hours) | Examination scheme (Marks) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Theory | Internal assessment (2 Assignments)* | Total marks | Duration of the exam |
| CPJ-101 | Japanese Scripts, vocabulary and Grammar-I | 2 | 18 | 35 | 15 | 50 | 3 Hours |
| CPJ-102 | Translation and Essay-I | 2 | 18 | 35 | 15 | 50 | |
| **Total Credits, Hours and marks** | | **04** | **36** | **70** | **30** | **100** | **--** |

**Note: only one examination will be held for both the courses**

* Assignments can be as MCQ's/Viva-Voce/Project Work.
** Duration of end term examination will be three hours.

4. **Syllabus for Certificate Programme in Japanese:**

**Course I- Japanese Scripts, Vocabulary and Grammar (Credit: 2)**

(i) Study of scripts: Hiragana, Katakana and Kanji.
(ii) Vocabulary and Grammar

**Course II- Translation and Essay (2 Credits)**

(i) Translation(English to Japanese and vice versa)
(ii) Essay writing

5. **Prescribed books:**

*Certificate Programme in Japanese:*

Minnano Nihongo (1-1), Goyal Publishers—Chapters 01 to 12
**Links for open resources will be shared with learners..*

# DEPARTMENT OF FOREIGN LANGUAGES

## KURUKSHETRA UNIVERSITY, KUSUKSHETRA

(Established by State Legislature Act XII of 1956)
(A + Grade, NAAC Accredited)

Syllabi and Scheme of Examination under Credit Based System of

### Certificate in Japanese Language

Structure, Scheme of Examination, Credits and Teaching Hours of Certificate Course in Japanese Language

| Paper No. | Name of the course | No. of Credits | Teaching hours per week | | | Examination scheme (Marks) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Theory Lecture | Tutorial | Total hours | Theory | Internal assessment | Total marks | Duration of the exam |
| FLCJ-101 | Japanese Scripts, vocabulary and Grammar-I | 4 | 3 | 1 | 4 | 70 | 30 | 100 | 3 Hours |
| FLCJ-102 | Translation and Essay-I | 4 | 3 | 1 | 4 | 70 | 30 | 100 | 3 Hours |
| **Total Credits, Hours per week and marks inyear** | | **08** | | | **08** | **140** | **60** | **200** | -- |

## Certificate in Japanese Language

Japanese Scripts, Vocabulary and Grammar-I
CODE: FLCJ-101

**Credits: 4**

**Theory: 70**
**Internal Assessment: 30**
**Max. Marks: 100**
**Time: 3 Hours**

(i) Study of scripts: Hiragana, Katakana and Kanji.
(ii) Vocabulary and Grammar

**Prescribed Book** –

Minna no Nihongo(1-1 and 1-2), Goyal Publishers—Chapters 01 to 25

**Semester End Examination:**

| | | |
|---|---|---|
| (i) | Scripts | **20 marks** |
| (ii) | Vocabulary and Grammar | **50 marks** |

**Total Marks: 70**

**Internal Assessment:** Internal assessment will be based on the following criteria:

1. One class test will be held after two months of course. **10 marks**
2. Viva-voce examination (7.5+7.5 marks) will be held twice in a semester. First one will be conducted before the class test and the second one will be conducted before the End semester end examination. **20 marks**

**Total: 30**

## Certificate in Japanese Language

Translation and Essay-I
CODE: FLCJ-102

**Credits: 4**

**Theory: 70**
**Internal Assessment: 30**
**Max. Marks: 100**
**Time: 3 Hours**

(i) Translation (English to Japanese and vice versa)
(ii) Essay writing

**Prescribed Book**

Minna no Nihongo(1-1 and 1-2), Goyal Publishers—Chapters 01 to 25

**Semester End Examination:**

(i) Translations (English to Japanese 25marks, Japanese to English25 marks) 50 Marks
(ii) Essay writing on pre-assigned topics 20 Marks

**Total Marks: 70**

**Internal Assessment:** Internal assessment will be based on the following criteria:

1. One class test will be held after two months of course. **15 marks**

2. Two assignments (5+5 marks) will be taken twice in a year. First one will be submitted before the class test and the second one will be submitted before the End year end examination. **15 marks**

**Total: 30 Marks**

## Scheme of Examination and Syllabus of M.Lib.I.Sc.w.e.f. 2023-24

## Semester Wise Scheme of Teaching and Examination

## SEMESTER - I

| Paper Code | Nomenclature of Course | Total Credits | | | Teaching Work Load per week per group in Hours | IA Theory | Max. Marks Theory | IA Practical | Max. Marks Practical | Total Marks | Duration of Theory Exam | Duration of Practical Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | L | P | Total | | | | | | | | |
| **CORE COURSES** | | | | | | | | | | | | |
| **MLIS-201** | Information, Communicationa nd Society | 4 | 0 | 4 | 4 | 20 | 80 | -- | -- | 100 | 3 Hours | -- |
| **MLIS-202** | Information Storage and Retrieval | 4 | 0 | 4 | 4 | 20 | 80 | -- | -- | 100 | 3 Hours | -- |
| **MLIS-203** | Electronic Resource Management | 4 | 0 | 4 | 4 | 20 | 80 | -- | -- | 100 | 3 Hours | -- |
| **SKILL BASED COURSE** | | | | | | | | | | | | |
| **MLIS-204** | Digital Library and Content Management System-s(Practice) | 0 | 4 | 4 | 8* | -- | -- | 20 | 80 | 100 | --- | 3 Hours |
| **DISCIPLINE SPECIFIC ELECTIVE COURSE** | | | | | | | | | | | | |
| **MLIS-205 (a)** | Information Resources in Social Sciences | 4 | 0 | 4 | 4 | 20 | 80 | -- | -- | 100 | 3 Hours | -- |
| **MLIS-205 (b)** | Information Resources in Sciences | 4 | 0 | 4 | 4 | 20 | 80 | -- | -- | 100 | 3 Hours | -- |
| **MLIS-205(c)** | Metric Studies | 4 | 0 | 4 | 4 | 20 | 80 | -- | -- | 100 | 3 Hours | |

**OPEN ELECTIVE COURSE**

**(Inter-Disciplinary Course for the students of other Departments)**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LIS-OE-2** | Information Literacy | 2 | 0 | 2 | 2 | 10 | 40 | -- | -- | 50 | 2 Hours | -- |

**Core Courses Credits:** --
**Skill Based Course:** --
**Discipline Specific Elective Courses:** --

* Groups will be formed on the basis of student strength.

# SEMESTER - II

| Paper Code | Nomenclature of Course | Total Credits | | | Teaching Work Load per week per group in Hours | IA Theory | Max. Marks Theory | IA Practical | Max. Marks Practical | Total Marks | Duration of Theory Exam | Duration of Practical Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | L | P | Total | | | | | | | | |
| **CORE COURSES** | | | | | | | | | | | | |
| **MLIS-206** | Research Methods& Statistical Techniques | 4 | 0 | 4 | 4 | 20 | 80 | -- | -- | 100 | 3 Hours | -- |
| **MLIS-207** | Library and Information Centre Management | 4 | 0 | 4 | 4 | 20 | 80 | -- | -- | 100 | 3 Hours | -- |
| **MLIS-208** | Information Analysis, Consolidation & Repackaging | 3 | 1 | 4 | 5 | 10 | 50 | 10 | 30 | 100 | 3 Hours | 2 Hours |
| **MLIS-209** | Project Work | 0 | 4 | 4 | -- | -- | -- | -- | -- | 100 | -- | -- |
| **SKILL BASED COURSES** | | | | | | | | | | | | |
| **MLIS-210** | Content Creation &Design | 0 | 4 | 4 | 8* | -- | -- | 20 | 80 | 100 | --- | 3 Hours |
| **DISCIPLINE SPECIFIC ELECTIVE COURSES** | | | | | | | | | | | | |
| **MLIS-211 (a)** | Marketing of Information Products and Services | 4 | 0 | 4 | 4 | 20 | 80 | -- | -- | 100 | 3 Hours | -- |
| **MLIS-211 (b)** | Research Data Management | 4 | 0 | 4 | 4 | 20 | 80 | -- | -- | 100 | 3 Hours | -- |
| **MLIS-211 (c)** | Standards in the field of Library and Information Science | 4 | 0 | 4 | 4 | 20 | 80 | -- | -- | 100 | 3 Hours | -- |

**Core Courses Credits:** --
**Skill Based Course:** --
**Discipline Specific Elective Courses:** --

* Groups will be formed on the basis of student strength

# SEMSTER-I
# CORE COURSES

| MLIS – 201: INFORMATION, COMMUNICATION AND SOCIETY | Total Credit: 04<br>Total Marks: 100<br>Max. Marks ET Theory: 80<br>Max. Marks IA Theory: 20<br>Duration of Theory Exam: 3 Hrs. |
|---|---|

**Objectives**

- To introduce the students to the role of information and knowledge in the society;
- To acquaint the students with various theories, channels of & barriers to communication and information transfer process;
- To provide conceptual framework about social and legal implications of information; and
- To get familiarized with concepts of economics of information and knowledge management.

**Course Outcomes:** After completing this course, students shall be able to:

| | |
|---|---|
| **MLIS-201.1** | Understand information, related concepts and their scope; |
| **MLIS-201.2** | Comprehend the process of information generation and communication; |
| **MLIS-201.3** | Understand the social and legal implications as well as policies and infrastructure of information; and |
| **MLIS-201.4** | Know the conceptsrelated to economics of information and knowledge management. |

**Internal Assessment: 20 Marks (Presentation/Assignment/Test - 10 + Attendance - 5+ Class test/Assignment - 5)**

**Note for the Paper Setter**

The paper is divided into **4** Units. The examinees will be required to attempt ***Five***questions in all, including Question 1, which is compulsory and selecting ***One***question from each Unit (I – IV). Question 1 will consist of **8** short Answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set ***Two***questions from each Unit.

**Unit-1: Information: Nature, Property and Scope**

- Data, Information and Knowledge: Definition, Types, Nature, Properties and Scope
- Data, Information and Knowledge: Intellectual assets
- Information Science: Origin and Development, Scope and Coverage, Relationship with other Disciplines and Professions.

**Unit-2: Information Generation and Communication**

- Generation of Information: Modes and Forms, Communication process
- Types of Communication: Verbal and Non-verbal, Formal and Informal
- Models of communication, media and diffusion
- Barriers to Communication and remedial proposition
- Information transfer process: generation to utilization (information eco-system)
- Information theory: Measure and Contents Evaluation

**Unit-3: Information Society**

- Social implications of Information
- Freedom of Information- Concept, Censorship, Cyber Law, Data Security and Fair Use
- Policies in relation to Information, Right to Read and Write: Banning Books, Fatwa on Writers
- Information policies: national and international, UAP, UBC
- Information Infrastructure: National and Global
- Issues of Information Society: Social and Political
- Typology of Information Sector

**Unit-4 Economics of Information and Knowledge Management**

- Economics of Information: Concept, Scope and Objectives
- Information economics vs. Economics of information
- Demand and supply of information
- Production, distribution and consumption of information and knowledge
- Economic analysis models, cost-benefit analysis and cost effectiveness
- Information/Knowledge management: Concept and tools

**Recommended Readings**(List of suggested readings to be provided by concerned faculty)

| MLIS – 202: INFORMATION STORAGE AND RETRIEVAL | Total Credit: 4<br>Total Marks: 100<br>Max. Marks ET Theory: 80<br>Max. Marks IA Theory: 20<br>Duration of Theory Exam: 3 Hrs. |
|---|---|

**Objectives**

- Introduce with the different indexing systems;
- Familiarize with the concept of vocabulary control and various vocabulary control devices;
- Develop understanding of different search methods and search strategy; and
- Introduce with the main features of information retrieval systems and their evaluation.

**Course Outcomes:** After completing this course, students shall be able to:

| | |
|---|---|
| **MLIS-202.1** | Distinguish between the different types of indexing systems and their techniques; |
| **MLIS-202.2** | Understand and use the different vocabulary control devices in information retrieval; |
| **MLIS-202.3** | Conduct search using various search techniques; and |
| **MLIS-202.4** | Understand and evaluate the information retrieval systems. |

**Internal Assessment: 20 Marks (Presentation/Assignment/Test - 10 + Attendance - 5+ Class test/Assignment - 5)**

**Note for the Paper Setter**

The paper is divided into **4** Units. The examinees will be required to attempt **Five**questions in all, including Question 1, which is compulsory and selecting **One**question from each Unit (I – IV). Question 1 will consist of **8** short Answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set **Two**questions from each Unit.

**Unit- 1: Indexing Systems and Techniques**

- Assigned and Derived Indexing. Pre- Coordinate and Post- Coordinate indexing. Chain Indexing, PRECIS, POPSI.
- Keyword Indexing: KWIC, KWAC, KWOC.
- Concept of Automatic Indexing.
- Citation Indexing: Features of Scopus, Web of Science, Google Scholar.

**Unit- 2: Vocabulary Control**

- Vocabulary Control: Need, Purpose, Functions, Types and Characteristics.
- Vocabulary Control Tools.
- Subject Headings: LCSH, SLSH and MeSH.
- Thesaurus: Features, Structure and Construction, ERIC, UNESCO Thesaurus. Taxonomies.

**Unit- 3: Information Searching and Media**

- Search Methods and Search Strategy: Boolean Search, Heuristic Search, Proximity Search, Phrase Search, Truncation Search, etc.
- Information Searching in Different Media: Print and Electronic.
- Federated Search: Concept and Features.
- Web-Scale Discovery System: Concept and Features.
- Data Mining and Text Mining

**Unit- 4**: **Information Retrieval System**

- Information Retrieval System (IRS): Concept, Definition, Types, CharacteristicsComponents of IRS. Information Retrieval Models.
- Library Information Retrieval Systems.
- Evaluation of Information Retrieval Systems

**Recommended Readings**


1. Atchison (Jean) and Gilchrist (Alan). Thesaurus Construction: A Practical Manual. London: Aslib. 1972.
2. Chowdhary (GG). Introduction to Modern Information Retrieval. 2nd Ed. London: Facet Publishing, 2003. Gopinath (MA). Construction of Depth Version of Classification: A Manual. New Delhi. Wiley Eastern Limited, 1986.
3. Harter (Stephen P.). Online Information Retrieval: Concept, Principles and Techniques, Orlando, Academic Press, 1978.
4. Hepas (ITS). Information Retrieval: Computational and Theoretical Aspects. New York, Academic Press. 1978.
5. Houghton (Bernard) and Convey (John). Online Information Retrieval Systems: An Introductory Manual to Principles and Practices. 2nd Ed. London Clive Bingley, 1984.
6. Houghton (Bernad) Ed. Computer Based Information Retrieval Systems. London, Clive Bingley, 1968.
7. Lancaster (F Wilfrid). Information Retrieval Systems: Characteristics, Testing and Evaluation. 2nd Ed. New York: Wiley, 1979.
8. Ranganathan (S R). Prolegomena to Library Classification V1, Bangalore, Sarda Ranganathan Endowment for Library Science, 1967. Page 14 of 21
9. Rowley (Jennifer E). Abstracting and Indexing. Aldorshot: Gower, 1997.
10. Salton (G) Automatic Information Organisation and Retrieval, 1968.
11. Vickery (B C). Techniques of Information Retrieval. London: Butterworths, 1970.

| MLIS – 203: Electronic Resource Management | Total Credit: 4<br>Total Marks: 100<br>Max. Marks ET Theory: 80<br>Max. Marks IA Theory: 20<br>Duration of Theory Exam: 3 Hrs. |
|---|---|

**Objectives**

- To develop an understanding of the basic concept, types, and process of collection building of e-resources;
- To familiarize with the issues related to licensing, negotiation and access of e-resources;
- To introduce to the collaborative environment for better resource access and delivery with examples from leading consortia in India; and
- To make aware of various usage related standards, guidelines and services.

**Course Outcomes:** After completing this course, students shall be able to:

| | |
|---|---|
| **MLIS-203.1** | Understand the basic concept, types, and process of collection building of e-Resources; |
| **MLIS-203.2** | Grasp the issues related to licensing, negotiation, access, and use; |
| **MLIS-203.3** | Work in collaborative environment for better resource access and delivery with leading consortia in India; and |
| **MLIS-203.4** | Know the various usage related standards, guidelines and services. |

**Internal Assessment: 20 Marks (Presentation/Assignment/Test - 10 + Attendance - 5+ Class test/Assignment - 5)**

**Note for the Paper Setter**

The paper is divided into **4** Units. The examinees will be required to attempt ***Five***questions in all, including Question 1, which is compulsory and selecting ***One***question from each Unit (I – IV). Question 1 will consist of **8** short Answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set ***Two***questions from each Unit.

**UNIT I: E-Resources: Collection Development**

- Concept, Need, Characteristics, Benefits and Drawbacks of E-resources
- Types of E-Resources: E-books, E-journals, Databases, Electronic Theses & Dissertations etc.
- Collection Building Process –Electronic Resource Development Policy
- Budgeting, Pricing, Licensing, Ordering and Receiving, Evaluation of e-Resources
- Archiving and Preservation of E-Resources

**UNIT II: E-Resources: Negotiations, Licensing, and Access**

- Model Licenses and Guidelines for Collection Building
- Negotiation: Concept and Need
- Copyright in the Digital Environment/Digital Rights Management (DRM) and User Training
- Delivery of E-Resources & Access Management and Authentication
- Off-campus and Integrated Access

**UNIT III: E-Resources:Consortia**

- Concept, Need and Purpose of Consortia
- Growth andDevelopment of Consortia
- Collection Building of E-Resources through Consortia
- Consortia: e-ShodhSindhu, CeRA, NKRC, OCLC

**UNIT IV: E-Resources: Usage**

- Usage Statistics, E-Resource Usage Analysis
- Standards and Guidelines (COUNTER); Processing, Analysis and Presentation of Data
- Discovery based Services
- Usage Enhancement Measures

**Recommended Readings**


1. W Pattie, L. Y., Cox, B. J. (2020). Electronic Resources: Selection and Bibliographic Control. United States: CRC Press.
2. Patra, N. K. (2017). Digital Disruption and Electronic Resource Management in Libraries. United Kingdom: Elsevier Science.
3. Halaychik, C. S., Reagan, B. (2018). Licensing Electronic Resources in Academic Libraries: A Practical Handbook. United Kingdom: Elsevier Science.
4. Stachokas, G. (2019). The Role of the Electronic Resources Librarian. United Kingdom: Elsevier Science.
5. Lal, J., Tripathi, A. (2016). Library Consortia: Practical Guide for Library Managers. Netherlands: Elsevier Science.
6. Talbott, H., Zmau, A. (2018). Electronic Resources Librarianship: A Practical Guide for Librarians. United States: Rowman & Littlefield Publishers.
7. Conger, J. E. (2004). Collaborative Electronic Resource Management: From Acquisitions to Assessment. Westport: Libraries Unlimited.
8. Curtis, D., &Scheschy, V. M. (2005). E-journals: A how-to-do-it manual for building, managing, and supporting electronic journal collections. New York: Neal-Schuman Publishers.
9. Fenner, A. (2014). Managing digital resources in libraries. New York: Routledge.
10. Fowler, D. C. (2004). E-serials collection management: Transitions, trends, atechnicalities. New York: Haworth Information Press.
11. Garibyan, M., McLeish, S., &Paschoud, J. (2017). Access and identity management for libraries: Controlling access to online information. London: Facet Publishing.
12. Hanson, A., & Levin, B. L. (2003). Building a virtual library. Hershey: Information Science Pub.
13. Jones, W. (2014). E-journals access and management. New York: Routledge.
14. Katz, L. S. (2003). Collection Development Policies: New Dimension for Changing Collections. London: Routledge.
15. Kemp, R. (2008). E-resource evaluation & usage statistics: Selector's choices. Saarbrücken: VDM VerlagDr. Müller.
16. Lee, S. D. (2004). Building an electronic resource collection: A practical guide. London: Facet Publishing.

17. Lee, S. H. (2012). Electronic Resources and Collection Development. Hoboken: Taylor and Francis.
18. Webster, P. M. (2008). Managing electronic resources: New and changing roles for libraries. Oxford: Chandos.
19. Verminski, A., &Blanchat, K. M. (2017). Fundamentals of electronic resources management. Chicago : Neal-Schuman
20. Lee, Sul H. (2003). Electronic Resources and Collection Development. London: Routledge.
21. Yu, H., &Breivold, S. (2008). Electronic resource management in libraries: Research and practice. Hershey: Information Science Reference

# SKILL BASED COURSES

| MLIS – 204: DIGITAL LIBRARY & CONTENT MANAGEMENT SYSTEMS(PRACTICE) | **Total Credit: 4**<br>**Total Marks: 100**<br>**Max. Marks ET Practical: 80**<br>**Max. Marks IA Practical: 20**<br>**Duration of Theory Exam: 3 Hrs.** |
|---|---|

**Objectives**

- To develop skills in the installation process of GSDL / DSpace
- To enable to use, apply and customize Digital Libraries and Institutional Repositories through GSDL /DSpace
- To develop skills in the installation process of open-source Content Management System
- To enable to use, apply and customize Content Management Systemsthrough Joomla / Drupal / WordPress, etc.

**Course Outcomes:** After completing this course, students shall be able to:

| | |
|---|---|
| **MLIS-204.1** | Install the GSDL / DSpace |
| **MLIS-204.2** | Use, apply and customize Digital Libraries and Institutional Repositories through GSDL / DSpace |
| **MLIS-204.3** | Install the open-source Content Management System |
| **MLIS-204.4** | Use, apply and customiseopen-source Content Management System through Joomla / Drupal / WordPress, etc. |

**Internal Assessment: 20 Marks (Class test/Assignment – 5 Presentation/Assignment/Test - 10 + Attendance - 5)**

**Note for the Examiner**

The paper shall be divided into two parts-A&B and will be intended to know practical skills in the use and application of software.

**Part-A (30 Marks)**

**Unit-I**

- Installation of DSpace/ GSDL

**Unit-II**

- Use, Application and Customisation of DSpace/ GSDL

**Part-B (50 Marks)**

**Unit-III**

- Installationof OpenSourceContent Management Systems Joomla / Drupal / WordPress, etc.

**Unit-IV**

- Use, Application and Customisation of CMS Joomla / Drupal / WordPress, etc.

## Suggested Readings

1. Aberdour M. (2013). *Moodle for mobile learning*. Packt Publishing. Retrieved May 17 2023 from http://www.myilibrary.com?id=523876
2. Büchner Alex G. (2022). Moodle 4 administration : an administrator's guide to configuring securing customizing and extending Moodle (Fourth). Packt Publishing. Retrieved May 17 2023 from https://www.oreilly.com/library/view/-/9781801816724/
3. Leary S. (2013). Wordpress for web developers : an introduction for web professionals (2nd ed.). Apress. https://doi.org/10.1007/978-1-4302-5867-4
4. Coombs K. A. & Hollister A. J. (2010). *Open source web applications for libraries*. Information Today.
5. Haefele C. (2015). *Wordpress for libraries*. Rowman and Littlefield. Retrieved May 17 2023 from https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=1021211
6. Marzo L. &Crom A. de. (2023). *Joomla! 4 masterclass : a practitioner's guide to building rich and modern websites using the brand-new features of joomla 4*. Packt Publishing Limited. Retrieved May 17 2023 from https://www.oreilly.com/library/view/-/9781803238975/
7. Sipos D. (2020). Drupal 9 module development : get up and running with building powerful drupal modules and applications (Third). Packt Publishing. Retrieved May 17 2023 from http://www.vlebooks.com/vleweb/product/openreader?id=none&isbn=9781800200548
8. Bhandari, M. (2020). Comparison of Wordpress, Joomla and Drupal. Retrieved May 17 2023 from https://www.theseus.fi/bitstream/handle/10024/338983/mahesh_thesis.pdf?sequence=2
9. Bishop A. P. Van House N. A. &Buttenfield B. P. (2003). *Digital library use : social practice in design and evaluation*. MIT Press. Retrieved May 17 2023 from http://site.ebrary.com/id/10225273
10. Todaro, J. B. (2014). Library management for the digital age: A new paradigm. Lanham: Rowman & Littlefield.
11. Witten, I. H., Bainbridge, D., & Nichols, D. M. (2010). How to build a digital library. Burlington, MA: Morgan Kaufmann Publishers.
12. Zhang, A. &Gourley, D. (2009). Creating Digital Collections: A Practical Guide. Oxford: Chandos Publishing.
13. King M. A. (2008). *Implementation of dspace at the intercontinental hotels group : implementation of dspace at the intercontinental hotels group*. Idea Group. Retrieved May 17 2023 from http://public.ebookcentral.proquest.com/choice/publicfullrecord.aspx?p=3309437
14. Massachusetts Institute of Technology & Hewlett-Packard Company. (2002). *Dspace : durable digital depository*. MIT Libraries. Retrieved May 17 2023 from http://dspace.org/
15. Witten I. H. & University of Waikato. (2005). *Stoned : a bridge between greenstone and dspace*. Dept. of Computer Science University of Waikato.
16. Kruk S. R. & McDaniel W. D. (2009). *Semantic digital libraries*. Springer. https://doi.org/10.1007/978-3-540-85434-0

# DISCIPLINE SPECIFIC ELECTIVE COURSES

| | |
|---|---|
| **MLIS – 205(a): INFORMATION RESOURCES IN SOCIAL SCIENCES** | **Total Credit: 4**<br>**Total Marks: 100**<br>**Max. Marks ET Theory: 80**<br>**Max. Marks IA Theory: 20**<br>**Duration of Theory Exam: 3 Hrs.** |

**Objectives**

- Discuss the development ofSocial Sciences as disciplines;
- Evaluate the different information sources in Social Sciences;
- Study the role of various Social Science information institutions; and
- Study the different documentation centres, systems and networks in Social Sciences.

**Course Outcomes:** After completing this course, students shall be able to:

| | |
|---|---|
| **MLIS-205(a).1** | Understand the structure and development of different disciplines of Social Sciences; |
| **MLIS-205(a).2** | Critically analyse the various information sources inSocial Sciences; |
| **MLIS-205(a).3** | Assess the functions of social science information institutions; and |
| **MLIS-205(a).4** | Evaluate the information systems and networks in Social Sciences. |

**Internal Assessment: 20 Marks (Presentation/Assignment/Test - 10 + Attendance - 5+ Class test/Assignment - 5)**

**Note for the Paper Setter**

The paper is divided into **4** Units. The examinees will be required to attempt **Five**questions in all, including Question 1, which is compulsory and selecting **One**question from each Unit (I – IV). Question 1 will consist of **8** short Answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set **Two**questions from each Unit.

**Unit 1: Structure and Development of Social Sciences:**

- Growth and Development of Social Sciences.
- Definition, Scope, Landmarks and Research Trends in the Disciplines of: Political Science, Economics, History, Sociology and Psychology.
- Study the contributions of Eminent Social Scientists.

**Unit 2: Social Sciences Information Sources**

- Social Science (print) Literature- Format, Popular and Scholarly Literature, Derived and Bibliographical Literature.
- Web based Information Sources: E-journals, Databases- Bibliographic and Full-text Subject Gateways, Institutional Repositories, Digital Libraries.
- Evaluation of: International Encyclopaedia of Social and Behavioural Sciences, International Bibliography of the Social Sciences, EconLit, PsycINFO, Indian Citation Index, ProQuest, Web of Science, Scopus, JSTOR

**Unit 3: Social Sciences Information Institutions**

- Institution connected with Social Science Information Generation to Dissemination.
- Study of the activities of: ICSSR, ICWA, National Council for Applied Economic Research, TISS, ICHR, United Nations- ECOSOC, UNESCO.

**Unit 4: Documentation Centers and Networks**

- Planningof Social Science Research Libraries.
- Study of existing Documentation Centres, Information Systems and Networks in Social Sciences at National and International level
- INFLIBNET, DELNET, DEVSIS, NASSDOC, SENDOC, DEVINSA, APINESS, Social Science Research Network (SSRN).

**Recommended Readings**(List of suggested readings to be provided by concerned faculty)

| MLIS – 205(b): INFORMATION RESOURCES INSCIENCES | Total Credit: 4<br>Total Marks: 100<br>Max. Marks ET Theory: 80<br>Max. Marks IA Theory: 20<br>Duration of Theory Exam: 3 Hrs. |
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**Objectives**

- Discuss the development of Sciences as disciplines;
- Evaluate the different information sources in Sciences;
- Study the role of various Science information institutions; and
- Study the different documentation centres, systems and networks in Sciences.

**Course Outcomes:** After completing this course, students shall be able to:

| | |
|---|---|
| **MLIS-205(c).1** | Understand the structure and development of different disciplines of Sciences; |
| **MLIS-205(c).2** | Critically analyse the various information sources in Sciences; |
| **MLIS-205(c).3** | Assess the functions of Science information institutions; and |
| **MLIS-205(c).4** | Evaluate the information systems and networks in Sciences. |

**Internal Assessment: 20 Marks (Presentation/Assignment/Test - 10 + Attendance - 5+ Class test/Assignment - 5)**

**Note for the Paper Setter**

The paper is divided into **4** Units. The examinees will be required to attempt ***Five***questions in all, including Question 1, which is compulsory and selecting ***One***question from each Unit (I – IV). Question 1 will consist of **8** short Answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set ***Two***questions from each Unit.

**Unit 1: Structure and Development of Sciences:**

- Definition, Scope and Landmarks in the Disciplines of
  - Physics
  - Chemistry
  - Mathematics
  - Biology
- Significant contributors in Growth and Development of Disciplines of Sciences

**Unit 2: Sciences Information Sources**

- Science Information System: Components
- Literature of Sciences- Format, Popular and Scholarly literature, Derived and Bibliographical Literature.
- Web based Information Sources: E-Books, E-journals, Databases- Bibliographic and Full-

text, Subject Gateways, Institutional Repositories, Digital Libraries

- AccessScience, Medline, PubMed, SciFinder,ProQuest, INSPEC, Web of Science, Scopus, BIOSIS, Google Scholar

**Unit 3: Science Information Institutions**

- Institutions connected with Sciences from Information Generation to Dissemination
- Study of the activities of Indian Institute of Sciences (IIScs), Indian Institutes of Science Education and Research, National Centre of Biological Sciences, Jawaharlal Nehru Centre for Advanced Scientific Research, Royal Society of Chemistry, Indian Council of Medical Research (ICMR), Council of Scientific &Industrial Research (CSIR)

**Unit 4: Documentation Centers and Networks**

- Planning of Science Research Libraries
- Study of existing Information Systems and Networks of Sciences at National and International level: NIScPR,DESIDOC, INFLIBNET, Biotechnology Information System (BIS), ICMR Consortium, HELINET,arXiv, International Science Council (ISC), etc.

| MLIS – 205 (c): METRIC STUDIES | Total Credit: 4<br>Total Marks:100<br>Max. Marks ET Theory: 80<br>Max. Marks IA Theory: 20<br>Duration of Theory Exam: 3 Hrs. |
|---|---|

**Objectives**

- Become familiar with the fundamentals of Bibliometrics, Scientometrics, InformetricsWebometrics, and Altmetrics; and know about the basic bibliometric/Scientometric laws and their applications in the present time;
- Know the theoretical foundations of citation analysis and various evaluative bibliometric measures;
- Know about various bibliometric data sources like Web of Science, SCOPUS, Google Scholar, and impact measurement tools and techniques; and
- Know the advanced learning tools/ softwares for conducting metric Studies.

**Course Outcomes:** After completing this course, students shall be able to:

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|---|---|
| **MLIS-205.1** | Understand the fundamentals of Bibliometrics, Scientometrics, InformetricsWebometrics, and Altmetrics; and know about the basic bibliometric/Scientometric laws and their applications in the present time; |
| **MLIS-205.2** | Understand the theoretical foundations of citation analysis and various evaluative bibliometric measures; |
| **MLIS-205.3** | Understand the various bibliometric data sources like Web of Science, SCOPUS, Google Scholar, and impact measurement tools and techniques; and |
| **MLIS-205.4** | Understand the use advanced learning tools/ softwares for conducting metric Studies. |

**Internal Assessment: 20 Marks (Presentation/Assignment/Test - 10 + Attendance - 5+ Class test/Assignment - 5)**

**Note for the Paper Setter**

The paper is divided into **4** Units. The examinees will be required to attempt **Five**questions in all, including Question 1, which is compulsory and selecting **One**question from each Unit (I – IV). Question 1 will consist of **8** short Answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set **Two**questions from each Unit.

**UNIT I: Introduction to Bibliometrics, Scientometrics, and Informetrics, and related Laws**

- Concept and Definition of Librametrics, Bibliometrics, Scientometrics, Informetrics, Webometrics and Altmetrics.
- Theoretical foundation of Bibliometrics and Scientometrics; Limitations of Bibliometrics, Scientometrics, Informetrics and Webometrics
- Classical Laws of Bibliometrics - Broadford's Law, Zipf s Law, Lotka's Law, Brookes, Leimkhler, Bookstein Formulation, Bradford-Zipf Distribution; Price

Theory, Ortega Hypothesis.

- Garfield's Law of Concentration, Mathew effect, Other models of Scientific Communications

**UNIT II: Evaluative Bibliometrics**

- Theoretical foundations of Citation Analysis – Merton's Normative Frameworks, Social Constructivist Theory, Cronin's Micro-sociological view and other views.
- Historical Perspectives of Evaluative Bibliometrics
- Publication Productivity Dynamics - Journal level, Institutional level, Regional level, National level, Global level, Discipline level publication
- Research Collaboration Dynamics-individual, Institution, Regional, National and Global level.

**UNIT III: Bibliometrics/ Scientometrics Indicators and Emerging Trends**

- Bibliometric Data Sources: Scopus, Web of Science
- Bibliometric Data Sources Google Scholar; Crossref, Demensions, Lens and Scite.ai.
- Journal citation measures – Simple measures: Journal Immediacy Index, Journal Impact Factor, Journal Citation Indicator, CiteScore, SNIP, Cited Half-life/ Citing Half Life.
  Weighted Factor: Eigenfactor, SJR.
- Individual Impact Measures-H-Index, g-index, i10-indexetc; Co-Citation Analysis, Bibliographic Coupling.

**UNIT IV: Advanced Learning in Metric Studies**

- Scientometrics Analysis Tools- R Software -Bibliometrix, Publish or Perish, Bibexcel, etc.;
- Network Visualization Software – VoSviewer; Pajek, Sci$^2$Tools, CiteSpace, etc
- Altmetrics and WebometricData Source and Analysis
- Altmetric Tools: Altmetric.com, ImpactStory,
- Responsible Research Metrics – DORA declaration, Leiden Manifesto, etc.

**Recommended Readings**


1. Bornmann, L., & Daniel, H. D. (2008). What do citation counts measure? a review of studies on citing behavior. *Journal of Documentation*, 64(1), 45 – 80.
2. Cronin, B. & Sugimoto, C. (Eds). (2014) Beyond Bibliometrics : Harnessing Multidimensional Indicators of Scholarly Impact. Massaschussets, MIT Press
3. Cronin, B. (1984). The citation process: the role and significance of citations in scientific communication: Taylor Graham.
4. Cronin, B., & Atkins, H.B. (Eds.). (2000). The Web of Knowledge: A Festschrift in Honor of Eugene Garfield: Information Today Inc.

5. De Bellis, N. (2009). Bibliometrics and Citation Analysis: From the Science Citation Index to Cybermetrics. Lanham: Scarecrow Press.
6. Egghe, L. (2005). Power Laws in the Information Production Process: LotkaianInformetrics: Emerald Group Publishing Limited.
7. **Glänzel,** W., **Moed**, H.F**., Schmoch,** U., **Thelwall,** M. (Eds.) (2019) Springer Handbook of Science and Technology Indicators. Cham, Switzerland: Springer Nature
8. Haustein, S. (2012). *Multidimensional journal evaluation: Analyzing scientific periodicals beyond the Impact Factor*. Berlin : De Gruyter.
9. Moed, H. F. (2005). *Citation analysis in research evaluation*. Dordrecht,:Springer.
10. Sugimoto, C. R. (Ed.)( 2016), *Theories of Informetrics and Scholarly Communication*: *A festschrift in honor of Blaise Cronin*
11. Thelwall, M. (2016). Web indicators for research evaluation: A practical guide. Synthesis Lectures on Information Concepts, Retrieval, and Services. San Rafael, CA: Morgan & Claypool Publishers.
12. Vinkler, P. (2010). The Evaluation of Research by Scientometric Indicators. Oxford: Chandos.
13. Waltman, L. (2016). A review of the literature on citation impact indicators. *Journal of Informetrics*, 10(2), 365–391. https://doi.org/10.1016/j.joi.2016.02.007.
14. Wilsdon, J. (2016), Towards Metric Tide: Independent Review of the Role of Metrics in Research Assessment and Management, Sage publication/ HEFCE, UK

# OPEN ELECTIVE COURSE FOR OTHER FACULTY STUDENTS

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|---|---|
| **LIS-OE-2: INFORMATION LITERACY** | **Total Credit: 2**<br>**Total Marks: 50**<br>**Max. Marks ET Theory: 40**<br>**Max. Marks IA Theory: 10**<br>**Duration of Theory Exam: 2 Hrs.** |

**Objectives**

- To Introduce the students with the concept of information literacy and its importance;
- To Introduce the students with main characteristics of various types of information sources;
- To introduce the students with literature search process and techniques; and
- To acquaint the students with techniques of evaluation and ethical use of information.

**Course Outcomes:** After completing this course, the students will be able to:

| | |
|---|---|
| **LIS-OE-2.1** | Understand the concept of information literacy and its importance; |
| **LIS-OE-2.2** | Distinguish among different types of information sources; |
| **LIS-OE-2.3** | Conduct literature search using different search techniques; and |
| **LIS-OE-2.4** | Evaluate and ethically use the information sources. |

**Internal Assessment: 10 Marks (Assignment–10)**

**Note for the Paper Setter**

The paper is divided into 4 Units. The examinees will be required to attempt *One* question from each Unit (I – IV). The Examiner will set *Two* questions from each Unit.

**Unit-I: Information Literacy and Information Needs**

- Information and its need, importance
- Information Literacy: Concept, Definition, Types
- Information Literacy and Lifelong Learning
- Information Needs and their Expression

**Unit-II: Information Sources**

- Information Sources- Documentary and Non-documentary
- Human and Institutional Information Sources-Sahitya Academy, IGNCA
- Primary, Secondary and Tertiary Information Sources
- E-resources- e-books, e-journals, databases Full text and Bibliographic. DOAJ, DOAB, OpenDOAR

**Unit-III: Information Search Process and Technique**

- Literature Search Process and Search Statement.
- Search in Print and Electronic Sources
- Literature Search Techniques: Boolean search, Truncation, Phrase search, etc.
- Library OPAC Searching, Database searching

**Unit-IV: Information Evaluation and Information Ethics**

- Evaluation of information sources
- Ethical use of information
- Plagiarism- Concept andTypes
- Citation styles- MLA style

**Recommended Books**

(List of suggested readings to be provided by concerned faculty)

## SEMESTER – II
## CORE COURSES

| **MLIS – 206: Research Methods& Statistical Techniques** | **Total Credit: 4**<br>**Total Marks: 100**<br>**Max. Marks ET Theory: 80**<br>**Max. Marks IA Theory: 20**<br>**Duration of Theory Exam: 3 Hrs.** |
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**Objectives**

- To make aware about the concept, types, methods and process of research;
- To introduce with the different aspects of research process;
- To familiarise in the use of descriptive statistical tools and techniques of data presentation; and
- To develop research reporting skills.

**Course Outcomes:** After completing this course, students shall be able to:

| | |
|---|---|
| **MLIS-206.1** | Understand the basic concept of research and be familiar with its different types, methods of conducting research and the process of research; |
| **MLIS-206.2** | Know the different aspects of research process such as research design, hypothesis, sampling techniques, and data collection methods; |
| **MLIS-206.3** | Analyse, present and interpret the qualitative and quantitative data with proper statistical tools; and |
| **MLIS-206.4** | Develop research reporting skills such as report writing, citation management, evaluation of research report; as well as know the current trends in LIS research. |

**Internal Assessment: 20 Marks (Presentation/Assignment/Test - 10 + Attendance - 5+ Class test/Assignment - 5)**

**Note for the Paper Setter**

The paper is divided into **4** Units. The examinees will be required to attempt ***Five***questions in all, including Question 1, which is compulsory and selecting ***One***question from each Unit (I – IV). Question 1 will consist of **8** short Answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set ***Two***questions from each Unit.

**Unit 1: Concept of Research**

- Research - Concept, Characteristics, Scope and Research Ethics.
- Types of Research – Basic and Applied, Interdisciplinary and Multidisciplinary.
- Research Methods: Historical, Descriptive, Experimental and Delphi.
- Research Process
- Research Proposal

**Unit 2: Research Tools and Techniques**

- Research Design, Hypothesis
- Sampling Techniques.

- Methods of Data Collection (Qualitative and Quantitative): Questionnaire, Interview, Observation, Library Records, Scales and Checklist.

**Unit 3: Statistical Technique**

- Statistics: Data and Variables.
- Measure of Central Value – Mean, Mode, Median and SD
- Correlation, Regression and Cross Tabulation. Statistical Packages – Spreadsheet, SPSS
- Graphical presentation of data: Bar, Pie, Line graphs, Histograms

**Unit 4: Research Report Writing**

- Report Writing
- Citation and Reference Management Tools.
- Evaluation of Research Report.
- Trends in Library and Information Science Research

**Recommended Readings**


1. Busha, C H. and Harter, S P (1980). Research methods in librarianship. New York: Academic Fowler, F J Jr (1993). Survey research methods. New Delhi: Sage
2. Glazer, J D and Powell, R R (1992). Qualitative research in information management. Englewood: Libraries Unlimited
3. Goode, W J. and Hatt, P K (1981). Methods in social science research. Auckland: McGraw Hill
4. Kin, Robert K (1989). Case study research: Design and methods. New Delhi: Sage Publications
5. Kraft, D H and Royce, B R (1991). Operations research for libraries and Information Agencies. San Diego: Academic Press
6. Krishnaswamy, O R (1993). Methodology for research in social sciences. Delhi: Himalayan Publishing House
7. Lancaster, F W (1993). If you want to evaluate your library. London: LA
8. Line, M B (1967). Library surveys. London: Clive-Bingley
9. Savanur, S K (2008). Research methodology for information sciences. Pune: Universal Prakashan Simpson, I S (1990). How to interpret statistical data. London: LA
10. Alasuutari, P., Bickman, L. & Brannen, J. (Eds.) (2008). The SAGE Handbook of Social Research Methods. London: Sage Publication.
11. Atkinson, P & Delamont, S. (Ed.) (2011) Sage Qualitative Research Methods. (Vols. 1-4). New Delhi: Sage Publication.
12. Bedi, S., & Webb, J. (Eds.). (2020). Visual Research Methods: An Introduction for Library and Information Studies. Facet Publishing.
13. Berger, A. A. (2018). Media and communication research methods: An introduction to qualitative and quantitative approaches. Sage Publications.
14. Burton, D. & Bartlett, S. (2009). Key Issues for Education Researchers. California: Sage Publication
15. Connaway, L. S., & Radford, M. L. (2016). Research methods in library and information science. ABC-CLIO.
16. Cooper, H. M. (2006). Synthesizing research: A guide for literature reviews. Thousand Oaks, Calif: Sage.
17. Creswell, J. W. (2014). Research design: Qualitative, quantitative, and mixed methods

approach. (4th ed.). California: Sage Publication
18. Fetterman, D. M. (2010). Ethnography: step-by-step (3rd Ed). (Applied social research methods series; v. 17). California: Sage Publication
19. Goon, A M. (2000). Fundamental of Statistics. Calcutta: World Press.
20. Julie McLeod, J. & Thomson, R. (2009). Researching Social Change: Qualitative Approaches. London: Sage Publication.
21. Leo, E. and Rousseau, R. (2001). Elementary Statistics for Effective Library and Information Service Management. London: Aslib.
22. Oliver, P. (2010). Understanding the Research Process. New Delhi: Sage Publication.
23. Powell, R. R.&Connaway, L. S. (2010). Basic Research methods for Librarians. 5th ed. Westport: Libraries Unlimited.
24. Powell, R. R., &Connaway, L. S. (2010). Basic research methods for librarians. Santa Barbara California: Libraries Unlimited
25. Wildemuth, B. M. (Ed.). (2016). Applications of social research methods to questions in information and library science. ABC-CLIO.

| MLIS – 207: LIBRARY AND INFORMATION CENTRE MANAGEMENT | Total Credit: 4<br>Total Marks:100<br>Max. Marks ET Theory: 80<br>Max. Marks IA Theory: 20<br>Duration of Theory Exam: 3 Hrs. |
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**Objectives**

- To provide the basic concepts related to library management;
- To develop an understanding ofhuman resource management;
- To enable students to understand financial management, its tools as well as quality management approaches; and
- To make aware about latest trends in library management.

**Course Outcomes:** After completing this course, students shall be able to:

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|---|---|
| **MLIS-207.1** | Understand the basic concepts related to library management; |
| **MLIS-207.2** | Understand the essential aspects of human resource management; |
| **MLIS-207.3** | Know the sources of finance and budgeting techniques as well as quality management concepts and tools; and |
| **MLIS-207.4** | Execute/create the Project or field assignment as per the knowledge gained in the course and be aware of how to manage change, time, stress and disaster. |

**Internal Assessment: 20 Marks (Presentation/Assignment/Test - 10 + Attendance - 5+ Class test/Assignment - 5)**

**Note for the Paper Setter**

The paper is divided into **4** Units. The examinees will be required to attempt **Five**questions in all, including Question 1, which is compulsory and selecting **One**question from each Unit (I – IV). Question 1 will consist of **8** short Answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set **Two**questions from each Unit.

**UNIT 1: ADVANCED MANAGEMENT**

- Management: Concept, Administration vs. Management & Functions of Management (POSDCORB)
- Management Schools of Thought: Classical, Neoclassical and Modern Management Theory
- Principles of Management: Scientific Principles & Administrative Principles
- Application of Management Principles in Libraries
- Management Information System (MIS)

**UNIT 2: HUMAN RESOURCE MANAGEMENT**

- Human Resource Management: Concept and Importance
- Human Resource Planning: Estimating Manpower Requirements

- Methods of Manpower Planning Job Analysis, Job description, Recruitment, Selection, Induction& Deployment
- Human Resource Development: Performance Appraisal, Training & Development

**UNIT 3: FINANCIAL MANAGEMENT AND TQM**

- Sources of Finance
- Budgeting: Concept, Types of budgets: Line, ZBB, PPBS
- Library planning: Types of Plans,Factors and Techniques of Library Planning.
- MBO: Definition, Process and Advantages
- Total Quality Management (TQM): Its Concept, Contribution of TQM Pioneers
- Quality Indicators in LIS: LibQUAL, ISO-9000

**UNIT 4: LATEST TRENDS IN LIBRARY MANAGEMENT**

- Stress Management
- Time Management
- Project Management
- Change Management
- Disaster Management

**Recommended Readings**


1. Evans, G. Edward, Ward, Patricia Layzell, &Rugaas, Bendik (2000).
2. Management basics for information professionals. New York, Neal-Schuman
3. Krishan Kumar. (2007). Library management in electronic environment. New Delhi: Har- Anand Publications.
4. Mittal, R. L. (2007). Library administration: Theory and practice. 5 ed. New Delhi: EssEss. Panwar,
5. B. S. & Vyas, S. D. (1986). Library management. Delhi: R. R. Publishing. Ranganathan, S. R. (2006). Library administration. 2nd ed. New Delhi: EssEss.
6. Singh, M. (1983). Library and information management: Theory and practice. Delhi: IBT. Singh, R. S. P. (1990). Fundamentals of library administration and management. Delhi: Prabhat Publications. Stueart
7. R. D. & Moran, B. B. (2013). Libraries and information center management. 8 th ed. London: Libraries Unlimited.

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|---|---|
| **MLIS-208:INFORMATION ANALYSIS, CONSOLIDATION AND REPACKAGING** | **Total Credit: 4**<br>**Total Marks: 100**<br>**Max. MarksET Theory : 50**<br>**Max. Marks IATheory : 10**<br>**Duration of Theory Exam: 3 Hrs.**<br>**Max. Marks ET Practical : 30**<br>**Max. Marks IA Practical : 10**<br>**Duration of Practical Exam: 2 Hrs.** |

**Objectives**

- To orient students on how to critically analyze, evaluate and repackage information and to get awareness about presentation ofinformation;
- To train the students with practical skills in preparing information consolidationproducts; and
- To familiarize with information analysis and consolidation centre and the marketing of information products and services.

**Course Outcomes:** After completing this course, the students will be able to:

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| **MLIS-208.1** | Understand the concept of Information Analysis, Consolidation and Repackaging (IACR); |
| **MLIS-208.2** | Acquaint with different products and services and methodology of their preparation; |
| **MLIS-208.3** | Acquaint with managing IAC Centres and marketing of information products and services; and |
| **MLIS-208.4** | Develop practical skills in preparation of specific information products. |

**Part-I: Theory**

**Internal Assessment: 10 Marks (Attendance– 5 (Includes attendance of practical classes also) + Class Test/ Assignment – 5).**

**Note for the Paper Setter**

The paper is divided into 3 Units. The examinees will be required to attempt *Four* questions in all, including Question 1, which is compulsory and selecting *One* question from each Unit (I – III). Question 1 will consist of 7 short answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set *Two* questions from each Unit.

**Unit – I**: **Information Analysis, Consolidation and Repackaging(IACR).**

- Information Analysis, Consolidation and Repackaging: Need, Purpose and Advantages.
- IACR Processes: Pre-requisites and Steps.
- Packaging and Repackaging of Information.
- Modes of Presentation: Textual and Non-Textual Presentation.
- Technical Writing: Characteristics, Pre-requisites and Guiding Principles.

**Unit – II: Processing Methods of IACR Products and Services.**

- IACR Products: Types and Steps for preparation.
- Role of various Specialists in design and development of IACR Products.
- Methodology for the preparation of: State-of-the-art Reports, Trend Reports, House Journals, Newsletters, Technical Digest, Abstract and Directory.

**Unit –III: Organization and Management of Information Analysis and Consolidation Centers (IAC).**

- Information Analysis and Consolidation Center (IAC): Need, Characteristics and Functions.
- Organization and Management of IAC Centre.
- Marketing: Definitions, Scope and Importance.
- Marketing of Information Products and Services.

**Part – II: Practice**

**Section-A**

**Total: 40 Marks** **Credit: 02**

**Internal Assessment: 10 Marks (Presentation/ Class Test – 5 + Class test/Assignment – 5 Marks)**

**Syllabus:**

Preparation of Indicative and Informative Abstract, Directory and Book Review.

**Section-B**

**Practical Examination:30Marks** **Time: 2Hours**

**ote:** There will be **two** questions for each examinee from the following:

1. The examinees will be required to prepare Abstracts (Indicative and Informative) of ResearchArticle given by the Examiner.
2. The examinees will be required to prepare Directory of Educational Institutions (10Entries).
3. The examinees will be required to prepare a Book Review on SpecifiedSubject.

**Recommended Books**


1. Atherton, Pauline. (1977). Handbook for Information Systems and Services. Paris: UNESCO.
2. Basu, B. N. (2007). Technical writing. New Delhi: Prentice Hall ofIndia.
3. Chatterjee, Amitabha (2013). Elements of Information Analysis, Consolidation and Repackaging (IACR). Kolkata: ProvaPrakashani.
4. Chopra, H.S. (1996). Information Marketing. Jaipur: RawatPublications.
5. Cooper, B. M. (1986). Writing Technical Reports. New York:Penguin.

6. Kotler, P. and Armstrong, G. Principles of Marketing, Ed.10, NewJersey.
7. Kumar, P.S.G. (2003). Information Analysis, Repackaging consolidation & Information retrieval (Paper X and XI of UGC Model Curriculum). Delhi: B.R.Pub.
8. Rowley, J.E (1982). Abstracting and Indexing. London: CliveBingley.
9. Rowley, J E (19960. The Basics of Information Systems. London: FacetPublishing.
10. Saracevic, T. and Wood, J. S. (1981).Consolidation of Information: A Handbook of Evaluation,RestructuringandRepackagingofScientificandTechnicalInformation.Paris: Unesco.
11. Seetharama, S. (1997). Information Consolidation and Repackaging: Framework, Methodology, Planning. New Delhi: EssEss Pub.
12. Seetharama, S. Modes of Presentation of Information in Information Consolidation Products. *Library Science with a Slant to Document*, 22; 1985; PaperE.
13. Sewa Singh. (2014).Information Analysis, Consolidation and Repackaging. New Delhi: Atlantic.

# DISCIPLINE SPECIFIC ELECTIVE COURSES

| | |
|---|---|
| **MLIS-210: CONTENT CREATION & DESIGN (PRACTICE)** | **Total Credit: 4**<br>**Total Marks: 100**<br>**Max. Marks IA Practical:20**<br>**Max. Marks Practical Exam: 80**<br>**Duration of Practical Exam: 3 Hrs.** |

**Objectives**

- To enhance students' web content creation skills and competencies for websites and blogs.
- To sensitize the students to various styles and techniques of content writing for Web 2.0 platforms, including Social Networking Sites.
- To train the students in designing websites, blogs, podcasts, infographics, and webinars, by providing practical classes
- To expose and prepare students for employment opportunities in the information industry and Librarianship in web content writing and editing for marketing Information products and services.

**Course Outcomes:** After completing this course, the students will be able to:

| | |
|---|---|
| **MLIS-210.1** | Create content for Websites, blogs, and video-sharing sites. |
| **MLIS-210.2** | Create content for Web 2.0 platforms, including Academic Social Networking Sites. |
| **MLIS-210.3** | Design and development of websites, blogs, videos, and infographics. |
| **MLIS-210.4** | Edit multimedia content using image editors, video editors, and text editors. |

**Internal Assessment: 20 Marks (Attendance: 5 + Class Test/ Assignment: 5).**

**Note for the Paper Setter**

The paper is divided into two parts (Part-A & Part B). It provides practical skills for creating and applying web platform content and development tools. The internal examiner shall apprise the external examiner about the specific content creation and development tools used in the classes and provide the course syllabus.

**Part-A (40 Marks)**

**Unit – I: Content Creation for Web Platforms**

- Creation of content for Websites and Blogs
- Creation of content for Video Sharing Platforms

**Unit – II: Content Creation for Web 2.0 Platforms**

- Creation of content for Web 2.0 Tools, including Academic Social Networking Sites
- Creation of content for Webinars and Web Tutorials
- Creation of content for Podcasts and Infographics

**Part-B (40 Marks)**

**Unit –III: Web Design and Development Tools**

- Designing Websites using various Content Management Systems
- Designing Blogs using various Blogging Tools
- Design and Development of Video Content (Tutorial) for Video Sharing Sites
- Design and Development of Infographics

**Unit –IV: Content Editing Tools**

- Multimedia Content creation and editing using Video Editors
- Image Creation and Editing using Image Editors
- Text Editing using Text Editors

**Recommended Books: The concerned faculty member will provide a list of books.**

| MLIS-211: MARKETING OF INFORMATION PRODUCTS AND SERVICES | Total Credit: 4<br>Total Marks: 100<br>Max. MarksET Theory : 80<br>Max. Marks IATheory : 20<br>Duration of Theory Exam: 3 Hrs. |
|---|---|

**Objectives**

- To orient students on how to market the information product and service to library patrons;
- To train the students with practical skills in preparing formarketing library services; and
- To familiarize with the best practices ofmarketing of information products and services.

**Course Outcomes:** After completing this course, the students will be able to:

| | |
|---|---|
| **MLIS-211.1** | Acquaint with managing and marketing of information products and services; |
| **MLIS-211.2** | Understand the marketing strategies and techniques; |
| **MLIS-211.3** | Acquaint with different aspects of marketing of information products and services; and |
| **MLIS-211.4** | Understand the marketing strategies adopted by important libraries in India. |

**Part-I: Theory**

**Internal Assessment: 20 Marks (Presentation/Assignment/Test - 10 + Attendance - 5+ Class test/Assignment - 5)**

**Note for the Paper Setter**

The paper is divided into 3 Units. The examinees will be required to attempt *Four* questions in all, including Question 1, which is compulsory and selecting *One* question from each Unit (I – III). Question 1 will consist of 7 short answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set *Two* questions from each Unit.

**UNIT – I: Fundamental Concepts**

- Needs, Objectives and Philosophy
- Marketing Environment: Producer, Consumer – Buyer Behaviour
- Market Segmentation and Product Differentiation
- Service Marketing Mix

**UNIT – II: Strategies and Techniques**

- Strategic Planning
- Marketing Research
- Marketing Process
- Evaluation of Marketing Efforts

**UNIT – III: Promotion of LIS Products and Services**

- LIS Products and Services as a Marketable Commodity
- Pricing, Distribution Channels and Communication Strategies
- Information Product Design & Development
- Public Relations
- E-Marketing

**UNIT – IV: Best Practices in Library Marketing** (IFLA International Marketing Award & Others)

**Recommended Books**


1. BAKEWELL (K G). Managing user-centred libraries and information services. Ed. 2. 1997. Maxwell, London.
2. BUTCHER (Helen).Meeting manager's information needs.1998. ASLIB, London.
3. CARPENTER (J) and DAVIES (R). Quantification of the overseas consulting market for professional consultancy services in librarianship and information science and information management. 1992. Research and Development, British Library, London.
4. COOTE (Helen) and BATCHELOR (Bridget). How to market your library services effectively. Ed. 2. 1997. Aslib, London.
5. GUPTA (D K), et al. Marketing library and information services: international perspectives. 2006. K.G. Saur, Munich.
6. HELINSKY (Z). A short-cut to marketing the library. 2008. Chandos Publishing, Oxford.
7. JAIN (Abhinandan K), et al. Marketing information products and services: a primer for libraries and information professionals. 1999. Tata McGraw-Hill, New Delhi.
8. KOTLER (Philip). Marketing management. Ed.12. 2002. Prentice Hall, Delhi.
9. KOTLER (Philip) and ARMSTRONG (Gary). Principle of marketing. Ed. 7. 1996. Prentice- Hall of India, New Delhi.
10. ROWLEY (Jenifer). Information marketing. 2001. Ashgate, London.

| MLIS – 211(b): RESEARCH DATA MANAGEMENT | Total Credit: 4<br>Total Marks: 100<br>Max. Marks ET Theory: 80<br>Max. Marks IA Theory: 20<br>Duration of Theory Exam: 3 Hrs. |
|---|---|

**Objectives**

- Introduce the concept of research data, its types, importance, curation and preservation, sharing, reuse and management;
- Introduce the data management plans and tools;
- Provide an overview of research data management services and their evaluation; and
- Develop understanding of ethical, legal and security issues related to research data management.

**Course Outcomes:** After completing this course, students shall be able to:

| | |
|---|---|
| **MLIS-211(d).1** | Understand the concept of research data, its types, importance, curation and preservation, sharing, reuse and management; |
| **MLIS-211(d).2** | Know how to create data management plans and understand the different data management tools; |
| **MLIS-211(d).3** | Organize, store, and preserve research data using appropriate strategies and tools; and |
| **MLIS-211(d).4** | Understand various research data management services in libraries and information centres and evaluate as well as addressthe issues related to data privacy, security, and ethical considerations in data management. |

**Internal Assessment: 20 Marks (Presentation/Assignment/Test - 10 + Attendance - 5+ Class test/Assignment - 5)**

**Note for the Paper Setter**

The paper is divided into **4** Units. The examinees will be required to attempt ***Five***questions in all, including Question 1, which is compulsory and selecting ***One***question from each Unit (I – IV). Question 1 will consist of **8** short Answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set ***Two***questions from each Unit.

**Unit I**

- Introduction to Research Data Management:Types of Data and Sources, Types of research data and research data lifecycle.
- The importance of Research Data Management.
- Overview of Data Management Planning Principles.
- Curation and Preservation of Research Data: Documentation and Metadata.
- Data Sharing and Reuse.

**Unit II**

- Creating Data Management plans: Components, Examples and related tools.
- FAIR Principles. Data Privacy and Ethics.
- Data Management Tools: Types of Data Management Tools, Comparison of Data Management Tools

**Unit III**

- Research Data Management Services:Concept Need and benefits.
- Data repositories: Concept, Need and Uses
- Research Data Management Services. Planning,organisingand Promoting
- Evaluating and Refining the RDM services.

**Unit IV**

- Issues in Data Management: Data Privacy and Security Considerations
- Ethical considerations in Data Management
- Legal and Policy Issues related to Data Management.
- Applying Research Data Management Principles
- Case Studies and Real-World Scenarios in Research Data Management.
- Development of a Data Management Plan for a Research Project.

**Suggested Readings**


1. Bhardwaj, R. K., & Banks, P. (2019). *Research Data Access and Management in Modern Libraries*. New York: IGI Global.
2. Ray, J. M. (Ed.). (2014). *Research data management: Practical strategies for information professionals*. Purdue University Press.
3. Willinsky, John. (2006). Access *Principle: Case for Open Access to Research and Scholarship*. Cambridge: MIT Press, Digital Libraries and Electronic Publishing.
4. Cox, A., &Verbaan, E. (2018). *Exploring Research Data Management*. Facet Publishing.
5. Whyte, A., &Tedds, J. (2011). *Making the Case for Research Data Management*. DCC.

| MLIS – 211(C): STANDARDS IN THE FIELD OF LIBRARY AND INFORMATION SCIENCE | Total Credit: 4<br>Total Marks: 100<br>Max. Marks ET Theory: 80<br>Max. Marks IA Theory: 20<br>Duration of Theory Exam: 3 Hrs. |
|---|---|

**Objectives**

- Awareness of the concept of standards and standardization process;
- Overview of activities of standardization institutions;
- Awareness of various standards in the area of library infrastructure; and
- Awareness of various standards in the area of library and information activities.

**Course Outcomes:** After completing this course, students shall be able to:

| | |
|---|---|
| **MLIS-211(c).1** | Understand the concept of standards, and how standards are made; |
| **MLIS-211(c).2** | Know the standards prepared by different national and international standardization institutions; |
| **MLIS-211(c).3** | Understand the areas of standardization related to library infrastructure and different standards prepared on these areas; and |
| **MLIS-211(c).4** | Understand the areas of standardization related to library and information activities and services and standards prepared on these areas. |

**Internal Assessment: 20 Marks (Presentation/Assignment/Test - 10 + Attendance - 5+ Class test/Assignment - 5)**

**Note for the Paper Setter**

The paper is divided into **4** Units. The examinees will be required to attempt ***Five***questions in all, including Question 1, which is compulsory and selecting ***One***question from each Unit (I – IV). Question 1 will consist of **8** short Answer (2 marks each) questions (having no internal choice) spread over the whole syllabi. The Examiner will set ***Two***questions from each Unit.

**Unit-1:Standards: An Overview**

- Standards: Definition, Types, Importance and Usefulness.
- Specifications, Guidelines, and other related terms.
- The process of Standardization at National and International level
- ISO Certifications: Information and Documentation - Quality Assessment; Quality-Statistics and Performance Evaluation

**Unit-2: National & International Standards**

- Activities of Standardization Institutions: ISO, BIS, ANSI, W3C, IFLA, LOC, ALA

**Unit-3:Standards related to Library Infrastructure**

- Standards for Library Infrastructure: Material,Building & Interiors,and Staff.

**Unit-4: Standards related to Library and Information activities and services**

- Standards for various Library and Information Activities:
- Knowledge Organization and Representation, Bibliographical Style
- ICT related Standards

**Suggested Readings**

(List of suggested readings to be provided by concerned faculty)

# KURUKSHETRA UNIVERSITY, KURUKSHETRA

*(ESTABLISHED BY THE STATE LEGISLATURE ACT XII OF 1956)*
*('A+' GRADE NAAC ACCREDITED)*

# Scheme & Syllabus of B.Tech. Degree in Electronics and Communications Engineering (ECE)

**(w.e.f. session 2023-24 onwards)**

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# GENERAL COURSE STRUCTURE & CREDIT DISTRIBUTION

## GENERAL COURSE STRUCTURE & THEME

**A. Definition of Credit***:

| | |
|---|---|
| 1 Hr. Lecture (L) per week | 1 Credit |
| 1 Hr. Tutorial (T) per week | 1 Credit |
| 1 Hr. Practical (P) per week | 0.5 Credit |
| 2 Hours Practical (P) per week | 1 Credit |

*Except for mandatory and value added courses

**B. Range of Credits:** The total number of credits proposed for the four-year B.Tech. degree in Electronics and Communication Engineering (ECE) is kept as 172. In addition to this, for B.Tech. with Honors & specialization/minor degree, the student has to acquire additional 18-20 credits through MOOC courses offered at SWAYAM/NPTEL portal.

**C. Structure of UG Program in Electronics and Communication Engineering (ECE):** The structure of UG program in Electronics and Communication Engineering (ECE) has essentially the following categories of courses with the breakup of credits as given:

| S. No. | Category | Credit Breakup for ECE |
|---|---|---|
| 1 | Humanities and Social Sciences including Management courses | 13.5 |
| 2 | Basic Science courses | 24 |
| 3 | Engineering Science courses including workshop, drawing, basicsof electronics/electrical/mechanical/computer etc. | 17.5 |
| 4 | Professional core courses | 62 |
| 5 | Professional Elective courses relevant to chosenspecialization/branch | 13 |
| 6 | Open subjects – Electives from other technical and /or emergingsubjects | 12 |
| 7 | Skill Enhancement Based Project work, seminar and internship in industry or elsewhere | 22 |
| 8 | Value Added and Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution, Essence of Indian Knowledge Tradition], [IDEAWorkshop, Personality Development and Soft Skills, National/International languages, NCC/NSS/Yoga/Sports/Technical and cultural activities] | 8 (1 for each course) |
| | **Total** | **172** |

**D. Course code and definition:**

| Course code | Definitions |
|---|---|
| L:T:P | Lecture: Tutorial: Practical |
| BSC | Basic Science Courses |
| ESC | Engineering Science Courses |
| HSC/HSM | Humanities and Social Sciences including Management courses |
| ECE | Program Core Courses |
| ECP | Program Elective Courses |
| OEC | Open Elective Courses |
| VAC | Value Added Courses |
| MAC | Mandatory Courses |

➢ **Category-wise Courses**

## HUMANITIES & SOCIAL SCIENCES COURSES [HSC/HSM]

| S.No | Course No./ Code | Subject | Semester | Hrs/ week | | | Credits |
|---|---|---|---|---|---|---|---|
| | | | | Lecture | Tutorial | Practical | |
| 1 | B23-HSC-101 | English for TechnicalWriting | I | 2 | 0 | 2 | 3 |
| 2 | B23-HSC-102 | Design Thinking | II | 0 | 0 | 3 | 1.5 |
| 3 | B23-HSM-101 | Universal Human Values- II: Understanding Harmony And Ethical Human Conduct | II | 3 | 0 | 0 | 3 |
| 4 | B23-HSM-202 | Innovation, Start- up and Entrepreneurship | IV | 3 | 0 | 0 | 3 |
| 5 | B23-HSM-201 | Organizational Behaviour | V | 3 | 0 | 0 | 3 |
| **Total Credits** | | | | | | | **13.5** |

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## BASIC SCIENCE COURSES [BSC]

| S. No | Course No./ Code | Subject | Semester | Hrs/ week | | | Credits |
|---|---|---|---|---|---|---|---|
| | | | | Lecture | Tutorial | Practical | |
| 1 | B23-BSC-104 | Engineering Chemistry | I | 3 | 0 | 2 | 4 |
| 2 | B23-BSC-107 | Mathematics-I | I | 3 | 1 | 0 | 4 |
| 3 | B23-BSC-106 | Biology | I | 3 | 0 | 0 | 3 |
| 4 | B23-BSC-102 | Introduction to Electromagnetic Theory | II | 3 | 1 | 2 | 5 |
| 5 | B23-BSC-108 | Mathematics-II | II | 3 | 1 | 0 | 4 |
| 6 | B23-BSC-202 | Complex Variables and Statistics | IV | 3 | 1 | 0 | 4 |
| **Total Credits** | | | | | | | **24** |

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## ENGINEERING SCIENCE COURSE [ESC]

| S. No | Course No./ Code | Subject | Semester | Hrs/ week | | | Credits |
|---|---|---|---|---|---|---|---|
| | | | | Lecture | Tutorial | Practical | |
| 1 | B23-ESC-101 | Programming for Problem Solving | I | 3 | 0 | 2 | 4 |
| 2 | B23-ESC-107 | Manufacturing Processes Workshop | I | 0 | 0 | 3 | 1.5 |
| 3 | B23-ESC-103 | Basic Electrical and Electronics Engineering | II | 3 | 1 | 2 | 5 |
| 4 | B23-ESC-102 | Engineering Graphics and Design | II | 1 | 0 | 4 | 3 |
| 5 | B23-ESC-201 | Integral Transforms & Numerical Techniques | III | 3 | 1 | 0 | 4 |
| **Total Credits** | | | | | | | **17.5** |

**PROGRAM CORE COURSES [ECE]**

| S. No. | Course No./ Code | Subject | Semester | Hrs /Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-ECE-201 | Electronic Devices | III | 3:0:0 | 3 |
| 2 | B23-ECE-211 | Electronic Devices Lab | III | 0:0:2 | 1 |
| 3 | B23-ECE-203 | Digital System Design | III | 3:0:0 | 3 |
| 4 | B23-ECE-213 | Digital System Design Lab | III | 0:0:2 | 1 |
| 5 | B23-ECE-205 | Signals and Systems | III | 3:0:0 | 3 |
| 6 | B23-ECE-215 | Signals and Systems Lab | III | 0:0:2 | 1 |
| 7 | B23-ECE-207 | Network Theory | III | 3:0:0 | 3 |
| 8 | B23-ECE-209 | Analog Communication | III | 2:1:0 | 3 |
| 9 | B23-ECE-202 | Advanced Microprocessors and Interfacing | IV | 3:0:0 | 3 |
| 10 | B23-ECE-204 | Analog Circuits | IV | 3:0:0 | 3 |
| 11 | B23-ECE-208 | Analog Circuits Lab | IV | 0:0:2 | 1 |
| 12 | B23-ECE-206 | Electromagnetic Waves | IV | 3:0:0 | 3 |
| 13 | B23-ECE-210 | Electromagnetic Waves Lab | IV | 0:0:2 | 1 |
| 14 | B23-ECE-212 | Programming with PYTHON | IV | 0:0:2 | 1 |
| 15 | B23-ECE-301 | Digital Signal Processing | V | 3:1:0 | 4 |
| 16 | B23-ECE-309 | Digital Signal Processing Lab | V | 0:0:2 | 1 |
| 17 | B23-ECE-303 | Digital Communication | V | 3:0:0 | 3 |
| 18 | B23-ECE-311 | Communication Lab | V | 0:0:2 | 1 |
| 19 | B23-ECE-305 | Microcontrollers | V | 3:0:0 | 3 |
| 20 | B23-ECE-313 | Microcontrollers Lab | V | 0:0:2 | 1 |
| 21 | B23-ECE-307 | Antenna and Wave Propagation | V | 3:0:0 | 3 |
| 22 | B23-ECE-315 | Microcontrollers Lab | V | 0:0:2 | 1 |
| 23 | B23-ECE-302 | Computer Networks | VI | 3:0:0 | 3 |
| 24 | B23-ECE-310 | Computer Networks Lab | VI | 0:0:2 | 1 |
| 25 | B23-ECE-304 | VLSI Design | VI | 3:0:0 | 3 |
| 26 | B23-ECE-306 | Wireless and Mobile Communication | VI | 3:0:0 | 3 |
| 27 | B23-ECE-308 | Control System Engineering | VI | 3:0:0 | 3 |
| 28 | B23-ECE-401 | Computer Architecture | VII | 3:0:0 | 3 |
| **Total** | | | | | **62** |

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**SKILL ENHANCEMENT BASED PROJECT WORK, SEMINAR AND INTERNSHIP**

| S. No. | Course No./ Code | Subject | Semester | Hrs /Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-ECE-214 | Project-I | IV | 0:0:6 | 3 |
| 2 | B23-ECE-312 | Project-II | VI | 0:0:4 | 2 |
| 3 | B23-ECE-403 | Seminar | VII | 0:0:2 | 1 |
| 4 | B23-ECE-405 | Industrial Training-II | VII | 0:0:4 | 2 |
| 5 | B23-ECE-407 | Project-III | VII | 0:0:4 | 2 |
| 6 | B23-ECE-412/414/416/418 | Project-IV/ Industrial Training/ Entrepreneurship/ Start-up | VIII | 0:0:24 | 12 |
| **Total** | | | | | **22** |

## PROGRAMME ELECTIVES

| S. No. | Course No./ Code | Subject | Semester | Hrs /Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | | PROGRAMME ELECTIVE-I | VI | 3:0:0 | 3 |
| 2 | | PROGRAMME ELECTIVE-I LAB | VI | 0:0:2 | 1 |
| 3 | | PROGRAMME ELECTIVE-II | VII | 3:0: 0 | 3 |
| 4 | | PROGRAMME ELECTIVE-III | VII | 3:0:0 | 3 |
| 5 | | PROGRAMME ELECTIVE-IV | VIII | 3:0: 0 | 3 |
| **Total** | | | | | **13** |

## LIST OF PROGRAMME ELECTIVE COURSES [ECP]

| S. No. | Course No./ Code | Subject | Semester | Hrs /Week L: T: P | Credits |
|---|---|---|---|---|---|
| 1 | B23-ECP-302 | Internet of Things | VI | 3:0: 0 | 3 |
| 2 | B23-ECP-314 | Internet of Things Lab | VI | 0: 0:2 | 1 |
| 3 | B23-ECP-304 | Microwave Engineering | VI | 3:0: 0 | 3 |
| 4 | B23-ECP-316 | Microwave Engineering Lab | VI | 0:0:2 | 1 |
| 5 | B23-ECP-306 | Biomedical Electronics | VI | 3:0: 0 | 3 |
| 6 | B23-ECP-318 | Biomedical Electronics Lab | VI | 0:0:2 | 1 |
| 7 | B23-ECP-308 | Digital Image Processing | VI | 3:0: 0 | 3 |
| 8 | B23-ECP-320 | Digital Image Processing Lab | VI | 0:0:2 | 1 |
| 9 | B23-ECP-405 | Transducers and their applications | VII | 3:0: 0 | 3 |
| 10 | B23-ECP-407 | Multimedia Communication | VII | 3:0: 0 | 3 |
| 11 | B23-ECP-409 | Information Theory and Coding | VII | 3:0: 0 | 3 |
| 12 | B23-ECP-411 | Bio-medical Signal Processing | VII | 3:0: 0 | 3 |
| 13 | B23-ECP-413 | Audio & Speech Processing | VII | 3:0: 0 | 3 |
| 14 | B23-ECP-415 | Satellite Communication | VII | 3:0: 0 | 3 |
| 15 | B23-ECP-417 | RF System | VII | 3:0: 0 | 3 |
| 16 | B23-ECP-419 | Wireless Sensor Networks | VII | 3:0: 0 | 3 |
| 17 | B23-ECP-421 | Advanced Mobile Communication | VII | 3:0: 0 | 3 |
| 18 | B23-ECP-423 | DSP Processors | VII | 3:0:0 | 3 |
| 19 | B23-ECP-402 | Fiber Optical Communication | VIII | 3:0: 0 | 3 |
| 20 | B23-ECP-404 | Embedded Systems | VIII | 3:0: 0 | 3 |
| 21 | B23-ECP-406 | Electronic Materials | VIII | 3:0: 0 | 3 |
| 22 | B23-ECP-408 | Radar Engineering | VIII | 3:0: 0 | 3 |
| 23 | B23-ECP-410 | Adaptive Signal Processing | VIII | 3:0:0 | 3 |

## OPEN ELECTIVES

| S. No. | Course No./ Code | Subject | Semester | Hrs /Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | | OPEN ELECTIVE-I | VI | 3:0:0 | 3 |
| 2 | | OPEN ELECTIVE-II | VII | 3:0:0 | 3 |
| 3 | | OPEN ELECTIVE-III | VII | 3:0:0 | 3 |
| 4 | | OPEN ELECTIVE-IV | VIII | 3:0:0 | 3 |
| **Total** | | | | | **12** |

## LIST OF OPEN ELECTIVE COURSES [OEC]

| S. No. | Course No./ Code | Subject | Semester | Hrs /Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-OEC-302 | Consumer Electronics | VI | 3:0:0 | 3 |
| 2 | B23-OEC-304 | Data Structure | VI | 3:0:0 | 3 |
| 3 | B23-OEC-306 | Bio-informatics | VI | 3:0:0 | 3 |
| 4 | B23-OEC-308 | Intellectual Property Rights (IPR) and Regulatory Framework | VI | 3:0:0 | 3 |
| 5 | B23-OEC-401 | Operating System | VII | 3:0:0 | 3 |
| 6 | B23-OEC-403 | Robotics & Automation | VII | 3:0:0 | 3 |
| 7 | B23-ECO-405 | Soft Computing | VII | 3:0:0 | 3 |
| 8 | B23-ECO-407 | Mixed Signal Design | VII | 3:0:0 | 3 |
| 9 | B23-ECO-409 | Power Electronics | VII | 3:0:0 | 3 |
| 10 | B23-ECO-411 | Artificial Intelligence & Machine Learning | VII | 3:0:0 | 3 |
| 11 | B23-ECO-413 | Blockchain Technology | VII | 3:0:0 | 3 |
| 12 | B23-OEC-415 | Neuro Fuzzy Systems | VII | 3:0:0 | 3 |
| 13 | B23-OEC-417 | Probability and Stochastic Processes | VII | 3:0:0 | 3 |
| 14 | B23-OEC-419 | Introduction to Digital Marketing | VII | 3:0:0 | 3 |
| 15 | B23-OEC-402 | Renewable Energy Resources | VIII | 3:0:0 | 3 |
| 16 | B23-OEC-404 | Supply Chain Management | VIII | 3:0:0 | 3 |
| 17 | B23-OEC-406 | Mobile App Development | VIII | 3:0:0 | 3 |
| 18 | B23-OEC-408 | Electric Vehicles | VIII | 3:0:0 | 3 |
| 19 | B23-OEC-410 | Gender Equality at Workplace | VIII | 3:0:0 | 3 |

## VALUE ADDED AND MANDATORY COURSES [VAC/MAC]

| S. No. | Course No./ Code | Subject | Semester | Hrs /Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-VAC-101 | Personality Development and Soft Skills | I | 2:0:0 | 1 |
| 2 | B23-VAC-102 | IDEA Workshop Theory | II | 2:0:0 | 1 |
| 3 | B23-VAC-104 | IDEA Workshop Lab | II | 0:0:3 | 1 |
| 4 | B23-VAC-302/304/306/308/310 | Hindi Language Skills/ Sanskrit Language Skills/ German Language Skills/ Japanese Language Skills/ French Language Skills | VI | 2:0:0 | 1 |
| 5 | B23-VAC-401/403/405/407/409/411 | NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/Society activities | VII | 0:0:2 | 1 |
| 6 | B23-MAC-201 | Environmental Studies | III | 3:0:0 | 1 |
| 7 | B23-MAC-202 | Essence of Indian Traditional Knowledge | IV | 3:0:0 | 1 |
| 8 | B23-MAC-301 | Constitution of India | V | 3:0:0 | 1 |
| **Total** | | | | | **8** |

# SEMESTER WISE STRUCTURE

## B.Tech. Electronics and Communications Engineering (ECE)
## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER I

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical exam | Total | |
| 1 | B23-HSC-101 | English for Technical Writing | 2:0:0 | 2 | 2 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ESC-101 | Programming for Problem Solving | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-BSC-104 | Engineering Chemistry | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-BSC-107 | Mathematics-I | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-106 | Biology | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-HSC-103 | English Language Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-105 | Programming for Problem Solving Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-107 | Manufacturing Processes Workshop | 0:0:3 | 3 | 1.5 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-BSC-114 | Engineering Chemistry Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 10 | B23-VAC-101 | Personality Development and Soft Skills | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **26** | **20.5** | **350** | **410** | **240** | **1000** | |

**Note:**

- **NCC/NSS/Sports/Yoga/Technical or cultural club/society activities will be joined by students in first year and will be evaluated in 7th semester by the institute based upon continuous evaluation model as per guidelines.**

## B.Tech. Electronics and Communications Engineering (ECE)

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER II

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester | Internal assessment | Practical Exam | Total | |
| 1 | B23-HSM-101 | Universal Human Values-II: Understanding Harmony and Ethical Human conduct | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-BSC-102 | Introduction to Electromagnetic Theory | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ESC-102 | Engineering Graphics and Design | 1:0:0 | 1 | 1 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-ESC-103 | Basic Electrical and Electronics Engineering | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-108 | Mathematics-II | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-BSC-112 | Electromagnetic Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-106 | Engineering Graphics and Design Lab | 0:0:4 | 4 | 2 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-108 | Basic Electrical and Electronics Engineering Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-HSC-102 | Design Thinking | 0:0:3 | 3 | 1.5 | -- | 100 | -- | 100 | 3 |
| 10 | B23-VAC-102 | IDEA Workshop Theory | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| 11 | B23-VAC-104 | IDEA Workshop Lab | 0:0:3 | 3 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **32** | **23.5** | **350** | **570** | **180** | **1100** | |

## B.Tech. Electronics and Communications Engineering (ECE)

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER-III

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-ESC-201 | Integral Transforms & Numerical Techniques | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ECE-201 | Electronic Devices | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ECE-203 | Digital System Design | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-ECE-205 | Signals and Systems | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-ECE-207 | Network Theory | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-ECE-209 | Analog Communication | 2:1:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 7 | B23-ECE-211 | Electronic Devices Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ECE-213 | Digital System Design Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-ECE-215 | Signals and Systems Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 10 | B23-MAC-201 | Environmental Studies | 3:0:0 | 3 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **28** | **23** | **420** | **400** | **180** | **1000** | |

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### SEMESTER-IV

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-BSC-202 | Complex Variables and Statistics | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-HSM-202 | Innovation, Start- up and Entrepreneurship | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ECE-202 | Advanced Microprocessors and Interfacing | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-ECE-204 | Analog Circuits | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-ECE-206 | Electromagnetic Waves | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-ECE-208 | Analog Circuits Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ECE-210 | Electromagnetic Waves Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ECE-212 | Programming with PYTHON | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-ECE-214 | Project-I | 0:0:6 | 6 | 3 | -- | 40 | 60 | 100 | 3 |
| 10 | B23-MAC-202 | Essence of Indian Traditional Knowledge | 3:0:0 | 3 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **31** | **23** | **350** | **410** | **240** | **1000** | |

**Note: All students have to undertake the industrial training for 6 to 8 weeks after 4th semester which will be evaluated in 5th semester.**

## B.Tech. Electronics and Communications Engineering (ECE)
## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER-V

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-HSM-201 | Organizational Behaviour | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ECE-301 | Digital Signal Processing | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ECE-303 | Digital Communication | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-ECE-305 | Microcontrollers | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-ECE-307 | Antenna and Wave Propagation | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-ECE-309 | Digital Signal Processing Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ECE-311 | Communication Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ECE-313 | Microcontrollers Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | *B23-ECE-315 | Industrial Training-I | 2:0:0 | 2 | -- | -- | 100 | -- | 100 | 3 |
| 10 | B23-MAC-301 | Constitution of India | 3:0:0 | 3 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **27** | **20** | **350** | **370** | **180** | **900** | |

**Note: *B23-ECE-315 is a mandatory non-credit course in which the students will be required to get passing marks.**

## B.Tech. Electronics and Communications Engineering (ECE)
## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER-VI

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-ECE-302 | Computer Networks | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ECE-304 | VLSI Design | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ECE-306 | Wireless and Mobile Communication | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-ECE-308 | Control System Engineering | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 5 | -- | Program Elective-I | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | -- | Open Elective-I | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 7 | B23-ECE-310 | Computer Networks Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | -- | Program Elective-I Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-ECE-312 | Project-II | 0:0:4 | 4 | 2 | -- | 40 | 60 | 100 | 3 |
| 10 | B23-VAC-302/304/306/308/310 | Hindi Language Skills/ Sanskrit Language Skills/ German Language Skills/ Japanese Language Skills/ French Language Skills | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **28** | **23** | **420** | **400** | **180** | **1000** | |

**Note:**

- **The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**
- **All students have to undertake the industrial training for 6 to 8 weeks after 6th semester which will be evaluated in 7th semester.**

| **List of Programme Elective and Open Elective Courses of 6th Semester** | | |
|---|---|---|
| **PROGRAMME ELECTIVE-I** | **PROGRAM ELECTIVE-I LAB** | **OPEN ELECTIVE-I** |
| **B23-ECP -302**<br>Internet of Things | **B23-ECP -314**<br>Internet of Things Lab | **B23-OEC-302**<br>Consumer Electronics |
| **B23-ECP-304**<br>Microwave Engineering | **B23-ECP-316**<br>Microwave Engineering Lab | **B23-OEC-304**<br>Data Structure |
| **B23-ECP-306**<br>Biomedical Electronics | **B23-ECP-318**<br>Biomedical Electronics Lab | **B23-OEC-306**<br>Bio-informatics |
| **B23-ECP-308**<br>Digital Image Processing | **B23-ECP-320**<br>Digital Image Processing Lab | **B23-OEC-308**<br>Intellectual Property Rights (IPR) and Regulatory Framework |

## B.Tech. Electronics and Communications Engineering (ECE)
## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER-VII

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-ECE-401 | Computer Architecture | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ECE-403 | Seminar | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 3 | B23-ECE-405 | Industrial Training-II | 0:0:4 | 4 | 2 | -- | -- | 100 | 100 | 3 |
| 4 | B23-ECE-407 | Project-III | 0:0:4 | 4 | 2 | -- | 40 | 60 | 100 | 3 |
| 5 | -- | Program Elective-II | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | -- | Program Elective-III | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 7 | -- | Open Elective-II | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 8 | -- | Open Elective-III | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 9 | *B23-VAC-401/403/405/407/409/411 | NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/Society activities | 0:0:2 | 2 | 1 | -- | 100 | -- | 100 | |
| **TOTAL** | | | | **25** | **21** | **350** | **330** | **220** | **900** | |

**Note:**

- **The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**
- ***B23-VAC-401/403/405/407/409/411 are single credit value added courses in which NCC/NSS/Sports/Yoga/Technical or Cultural Club/Society activities will be joined by students in first year and will be evaluated in 7th semester by the institute based upon continuous evaluation model as per guidelines.**

| List of Programme Elective and Open Elective Courses of 7th Semester | | | |
|---|---|---|---|
| **PROGRAMME ELECTIVE-II** | **PROGRAMME ELECTIVE-III** | **OPEN ELECTIVE-II** | **OPEN ELECTIVE-III** |
| **B23-ECP-405**<br>Transducers and their applications | **B23-ECP-415**<br>Satellite Communication | **B23-OEC-401**<br>Operating System | **B23-OEC- 411**<br>Artificial Intelligence & Machine Learning |
| **B23-ECP-407**<br>Multimedia Communication | **B23-ECP-417**<br>RF System | **B23-OEC-403**<br>Robotics & Automation | **B23-OEC-413**<br>Blockchain Technology |
| **B23-ECP-409**<br>Information Theory and Coding | **B23-ECP-419**<br>Wireless Sensor Networks | **B23-OEC-405**<br>Soft Computing | **B23-OEC-415**<br>Neuro Fuzzy Systems |
| **B23-ECP-411**<br>Bio-medical Signal Processing | **B23-ECP-421**<br>Advanced Mobile Communication | **B23-OEC-407**<br>Mixed Signal Design | **B23-OEC-417**<br>Probability and Stochastic Processes |
| **B23-ECP-413**<br>Audio & Speech Processing | **B23-ECP-423**<br>DSP Processors | **B23-OEC-409**<br>Power Electronics | **B23-OEC-419**<br>Introduction to Digital Marketing |

## B.Tech. Electronics and Communications Engineering (ECE)

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER-VIII

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam(Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | -- | Program Elective-IV | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | -- | Open Elective-IV | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ECE-412/414/416/418 | Project-IV/ Industrial Training/ Entrepreneurship/ Start-up | 0:0:24 | 24 | 12 | -- | 200 | 200 | 400 | 3 |
| **TOTAL** | | | | **30** | **18** | **140** | **260** | **200** | **600** | |

**Note:**

- **The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**
- **In case of semester-long project work done in industry/external institute, the Program Elective- IV and Open Elective-IV may be offered in online mode through MOOC courses offered by SWAYAM/NPTEL portal. These courses may be done from 3rd semester till completion of the degree.**

| **List of Programme Elective and Open Elective Courses of 8th Semester** | |
|---|---|
| **PROGRAMME ELECTIVE-IV** | **OPEN ELECTIVE -IV** |
| **B23-ECP-402**<br>Fiber Optical Communication | **B23-OEC-402**<br>Renewable Energy Resources |
| **B23-ECP-404**<br>Embedded Systems | **B23-OEC-404**<br>Supply Chain Management |
| **B23-ECP-406**<br>Electronic Materials | **B23-OEC-406**<br>Mobile App Development |
| **B23-ECP-408**<br>Radar Engineering | **B23-OEC-408**<br>Electric Vehicles |
| **B23-ECP-410**<br>Adaptive Signal Processing | **B23-OEC-410**<br>Gender Equality at workplace |

**Electronics and Communication Engineering**

Students of Electronics and Communication Engineering are offered to earn **ADDITIONAL 18-20 CREDITS** through MOOCs/SWAYAM courses as per the 'Guidelines to implement the SWAYAM/MOOCs/ other authorized online courses (OAOC) of Kurukshetra University, Kurukshetra' in any of the emerging areas mentioned below for the award of the degree of:

1. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Artificial Intelligence and Machine Learning**
2. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Internet of Things (IoT)**
3. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Blockchain**
4. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Robotics**
5. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Data Science**
6. **B.Tech. (Hons.) Electronics and Communication Engineering with Specialization in Cyber Security**
7. **B.Tech. Electronics and Communication Engineering with Minor Degree in 3D Printing**
8. **B.Tech. Electronics and Communication Engineering with Minor Degree in Electric Vehicles**
9. **B.Tech. Electronics and Communication Engineering with Minor Degree in Energy Engineering**
10. **B.Tech. Electronics and Communication Engineering with Minor Degree in Mechatronics**
11. **B.Tech. Electronics and Communication Engineering with Minor Degree in Computer Science and Biology**
12. **B.Tech. Electronics and Communication Engineering with Minor Degree in Drug Engineering**
13. **B.Tech. Electronics and Communication Engineering with Minor Degree in Genome Engineering and Technology**

# KURUKSHETRA UNIVERSITY, KURUKSHETRA

*(ESTABLISHED BY THE STATE LEGISLATURE ACT XII OF 1956)*
*('A+' GRADE NAAC ACCREDITED)*

# Scheme & Syllabus
# of
# B.Tech. Degree
# in
# Computer Science and Engineering(CSE)

**(w.e.f. session 2023-24 onwards)**

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# GENERAL COURSE STRUCTURE

# &

# CREDITDISTRIBUTION

## GENERALCOURSESTRUCTURE&THEME

**A. Definition of Credit***:

| | |
|---|---|
| 1Hr. Lecture(L) per week | 1Credit |
| 1Hr.Tutorial(T)per week | 1Credit |
| 1Hr.Practical(P)per week | 0.5Credit |
| 2HoursPractical(P)per week | 1Credit |

*Except for mandatory and value added courses

**B. Range of Credits:** The total number of credits proposed for the four-year B.Tech. degree in Computer Science and Engineering (CSE) is kept as 175. In addition to this, for B.Tech. with Honors & specialization/minor degree, the student has to acquire additional 18-20 credits through MOOC courses offered at SWAYAM/NPTEL portal.

**C. Structure of UG Program in** Computer Science and Engineering (CSE)**:**The structure of UG program in Computer Science and Engineering (CSE)has essentially the following categories of courses with the breakup of credits as given:

| Sr. No. | Category | Credit Breakup for CSE |
|---|---|---|
| 1 | Humanities and Social Sciences including Management courses | 16.5 |
| 2 | Basic Science courses | 23 |
| 3 | Engineering Science courses including workshop, drawing, basics of electronics/ electrical/mechanical/computer etc. | 18.5 |
| 4 | Professional core courses | 75 |
| 5 | Program Elective courses relevant to chosen specialization/branch | 15 |
| 6 | Open subjects–Electives from other technical and/or emerging subjects | 03 |
| 7 | Project work, seminar and internship in industry or else where | 16 |
| 8 | Mandatory and Audit Courses<br>[IDEA Workshop, IDEA Workshop Lab, Personality Development and Soft Skills, Environmental Studies, Induction Program, Constitution of India, Essence of Indian Knowledge Tradition, NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/ Society Activities] | 08 |
| | **Total** | **175** |

**D. Course code and definition:**

| Course code | Definitions |
|---|---|
| L:T:P | Lecture: Tutorial: Practical |
| BSC | Basic Science Courses |
| ESC | Engineering Science Courses |
| HSC/HSM | Humanities and Social Sciences including Management courses |
| CSE | Program Core Courses |
| PEC | Program Elective Courses |
| OEC | Open Elective Courses |
| VAC | Value Added Courses |
| MAC | Mandatory Courses |

➢ **Category-wise Courses**

## HUMANITIES & SOCIAL SCIENCES COURSES [HSC/HSM]

| S.No | Course No./ Code | Subject | Semester | Hrs/week | | | Credits |
|---|---|---|---|---|---|---|---|
| | | | | Lecture | Tutorial | Practical | |
| 1 | B23-HSC-101 | English for Technical Writing | II | 2 | 0 | 2 | 3 |
| 2 | B23-HSC-102 | Design Thinking | I | 0 | 0 | 3 | 1.5 |
| 3 | B23-HSM-101 | Universal Human Values-II: Understanding Harmony And Ethical Human Conduct | I | 3 | 0 | 0 | 3 |
| 4 | B23-HSM-202 | Innovation, Start ups and Entrepreneurship | V | 3 | 0 | 0 | 3 |
| 5 | B23-HSM-301 | Organizational Behaviour | III | 3 | 0 | 0 | 3 |
| 6 | B23-HSM-302 | Humanities–II Intellectual Property Rights (IPR) and Regulatory | IV | 3 | 0 | 0 | 3 |
| **Total Credits** | | | | | | | **16.5** |

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## BASIC SCIENCE COURSES [BSC]

| S. No | Course No./ Code | Subject | Semester | Hrs/week | | | Credits |
|---|---|---|---|---|---|---|---|
| | | | | Lecture | Tutorial | Practical | |
| 1 | B23-BSC-101 | Semiconductor Physics | I | 3 | 1 | 2 | 5 |
| 2 | B23-BSC-107 | Mathematics-I | I | 3 | 1 | 0 | 4 |
| 3 | B23-BSC-104 | Chemistry | II | 3 | 0 | 2 | 4 |
| 4 | B23-BSC-108 | Mathematics-II | II | 3 | 1 | 0 | 4 |
| 5 | B23-BSC-106 | Biology | II | 3 | 0 | 0 | 3 |
| 6 | BS23-BSC-203 | Probability Statistics | III | 3 | 0 | 0 | 3 |
| **Total Credits** | | | | | | | **23** |

******

## ENGINEERING SCIENCE COURSE[ESC]

| S. No | Course No./ Code | Subject | Semester | Hrs/week | | | Credits |
|---|---|---|---|---|---|---|---|
| | | | | Lecture | Tutorial | Practical | |
| 1 | B23-ESC-104 | Basic Electrical Engineering | I | 3 | 1 | 2 | 5 |
| 2 | B23-ESC-104 | Engineering Graphics and Design | I | 1 | 0 | 4 | 3 |
| 3 | B23-ESC-101 | Programming for Problem Solving | II | 3 | 0 | 2 | 4 |
| 4 | B23-ESC-107 | Manufacturing Practices Workshop | II | 0 | 0 | 3 | 1.5 |
| 5 | B23-ESC-212 | Digital Electronics | IV | 3 | 0 | 4 | 5 |
| **Total Credits** | | | | | | | **18.5** |

**PROGRAM CORE COURSES[CSE]**

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-CSE-201 | Data Structures and Algorithms | 3 | 3:0:0 | 3 |
| 2 | B23-CSE-203 | Computer Organization & Architecture | 3 | 3:0:0 | 3 |
| 3 | B23-CSE-205 | Object Oriented Programming | 3 | 3:0:0 | 3 |
| 4 | B23-CSE-207 | IT Workshop (Python) | 3 | 2:0:0 | 2 |
| 5 | B23-CSE-209 | Data Structures and Algorithms Lab | 3 | 0:0:4 | 2 |
| 6 | B23-CSE-211 | Object Oriented Programming Lab | 3 | 0:0:4 | 2 |
| 7 | B23-CSE-215 | IT Workshop (Python) Lab | 3 | 0:0:4 | 2 |
| 8 | B23-CSE-202 | Advanced Programming (Java) | 4 | 3:0:0 | 3 |
| 9 | B23-CSE-206 | Design and Analysis Algorithms | 4 | 3:1:0 | 4 |
| 10 | B23-CSE-208 | Principles of Programming Languages | 4 | 3:0:0 | 3 |
| 11 | B23-CSE-210 | Advanced Programming Lab (Java) | 4 | 0:0:4 | 2 |
| 12 | B23-CSE-212 | Digital Electronics Lab | 4 | 0:0:4 | 2 |
| 13 | B23-CSE-214 | Design & Analysis Algorithms Lab | 4 | 0:0:4 | 2 |
| 14 | B23-CSE-301 | Web and Internet Technology | 5 | 3:0:0 | 3 |
| 15 | B23-CSE-303 | Introduction to Database System | 5 | 3:0:0 | 3 |
| 16 | B23-CSE-305 | Machine Learning | 5 | 3:1:0 | 4 |
| 17 | B23-CSE-307 | Operating Systems | 5 | 3:0:0 | 3 |
| 18 | B23-CSE-309 | Web and Internet Technology Lab | 5 | 0:0:4 | 2 |
| 19 | B23-CSE-311 | Introduction to Database Systems Lab | 5 | 0:0:4 | 2 |
| 20 | B23-CSE-313 | Machine Learning Lab | 5 | 0:0:4 | 2 |
| 21 | B23-CSE-315 | Industrial Training-I | 5 | 0:0:0 | 0 |
| 22 | B23-CSE-302 | Computer Networks | 6 | 3:0:0 | 3 |
| 23 | B23-CSE-304 | Big Data Analytics and Visualization | 6 | 3:0:0 | 3 |
| 24 | B23-CSE-306 | Software Engineering | 6 | 3:0:0 | 3 |
| 25 | B23-CSE-308 | Computer Networks Lab | 6 | 0:0:4 | 2 |
| 26 | B23-CSE-310 | Big Data Analytics and Visualization Lab | 6 | 0:0:4 | 2 |
| 27 | B23-CSE-401 | Cloud Computing | 7 | 3:0:0 | 3 |
| 28 | B23-CSE-403 | Unix and Linux programming | 7 | 3:0:0 | 3 |
| 29 | B23-CSE-405 | Cloud Computing Lab | 7 | 0:04 | 2 |
| 30 | B23-CSE-407 | Unix and Linux programming Lab | 7 | 0:0:4 | 2 |
| **Total** | | | | | **75** |

******

**SKILL ENHANCEMENT BASED PROJECTWORK, SEMINAR AND INTERNSHIP**

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-CSE-312 | Project-1 | VI | 0:0:4 | 2 |
| 2 | B23-CSE-409 | Project-II | VII | 0:0:8 | 4 |
| 3 | B23-CSE-402 | Project-III | VIII | 0:0:20 | 10 |
| 4 | B23-CSE-315 | Industrial Training-I | V | 0:0:0 | 0 |
| 5 | B23-CSE-411 | Industrial Training-II | VII | 0:0:0 | 0 |
| **Total** | | | | | **16** |

## PROGRAMME ELECTIVES[PEC]

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | | PEC-I | PROGRAM ELECTIVE-I | VI | 3:0:0 |
| 2 | | PEC-II | PROGRAM ELECTIVE-II | VI | 3:0:0 |
| 3 | | PEC-III | PROGRAM ELECTIVE-III | VII | 3:0:0 |
| 4 | | PEC-IV | PROGRAMELECTIVE- IV | VIII | 3:0:0 |
| 5 | | PEC-V | PROGRAM ELECTIVE-V | VIII | 3:0:0 |
| **Total** | | | | | **15** |

## LIST OF PROGRAMME ELECTIVE COURSES [PEC]

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-PEC-314 | Android and Mobile App Development | VI | 3:0:0 | 3 |
| 2 | B23-PEC-316 | Deep Learning | VI | 3:0:0 | 3 |
| 3 | B23-PEC-318 | Natural Language Processing | VI | 3:0:0 | 3 |
| 4 | B23-PEC-320 | Automata Theory | VI | 3:0:0 | 3 |
| 5 | B23-PEC-322 | Compiler Design | VI | 3:0:0 | 3 |
| 6 | B23-PEC-324 | Theory of Computation | VI | 3:0:0 | 3 |
| 7 | B23-PEC-413 | Soft Computing | VII | 3:0:0 | 3 |
| 8 | B23-PEC-415 | Neural network and Fuzzy logic | VII | 3:0:0 | 3 |
| 9 | B23-PEC-417 | Simulation and Modelling | VII | 3:0:0 | 3 |
| 10 | B23-PEC-404 | Agile Software Engineering | VIII | 3:0:0 | 3 |
| 11 | B23-PEC-406 | Software Verification, Validation and Testing | VIII | 3:0:0 | 3 |
| 12 | B23-PEC-408 | Software Project Management | VIII | 3:0:0 | 3 |
| 13 | B23-PEC-410 | Social Networks | VIII | 3:0:0 | 3 |
| 14 | B23--PEC-412 | AI and Robotics | VIII | 3:0:0 | 3 |
| 15 | B23--PEC-414 | Block Chain Technology | VIII | 3:0:0 | 3 |
| 16 | B23-PEC-416 | Health Care and Analytics | VIII | 3:0:0 | 3 |

## OPEN ELECTIVES[OEC]

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | | OPEN ELECTIVE-I | OPEN ELECTIVE-I | VII | 3:0:0 |
| **Total** | | | | | **3** |

## LIST OF OPEN ELECTIVE COURSES [OEC]

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-OEC-417 | Cyber Law and Ethics | VII | 3:0:0 | 3 |
| 2 | B23-OEC-419 | International and Corporate Law | VII | 3:0:0 | 3 |
| 3 | B23-OEC-421 | Internet of Things | VII | 3:0:0 | 3 |
| 4 | B23-OEC-423 | Bioinformatics | VII | 3:0:0 | 3 |

## VALUE ADDED AND MANDATORYCOURSES [VAC/MAC]

| **S. No.** | **Course No./ Code** | **Subject** | **Semester** | **Hrs/Week L:T:P** | **Credits** |
|---|---|---|---|---|---|
| 1 | B23-VAC-101 | Personality Development and Soft Skills | II | 2:0:0 | 1 |
| 2 | B23-VAC-110 | IDEA Workshop Theory | I | 2:0:0 | 1 |
| 3 | B23-VAC-112 | IDEA Project Workshop | I | 0:0:2 | 1 |
| 4 | B23-VAC-302/304/306/308/310 | Hindi Language Skills/ Sanskrit Language Skills/ German Language Skills/ Japanese Language Skills/ French Language Skills | V | 2:0:0 | 1 |
| 5 | B23-VAC-401/403/405/407/409/411 | NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/Society activities | VII | 0:0:2 | 1 |
| 6 | B23-MAC-201 | Environmental Studies | IV | 2:0:0 | 1 |
| 7 | B23-MAC-202 | Essence of Indian Traditional Knowledge | III | 2:0:0 | 1 |
| 8 | B23-MAC-301 | Constitution of India | VI | 2:0:0 | 1 |
| **Total** | | | | | **8** |

# SEMESTER WISE STRUCTURE

## B.Tech. Computer Science and Engineering (CSE)

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER I

| S.No. | Course No./Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical exam | Total | |
| 1 | B23-BSC-101 | Semiconductor Physics | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-HSM-101 | Universal Human Values-II: Understanding Harmony and Ethical Human conduct | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ESC-102 | Engineering Graphics and Design | 1:0:0 | 1 | 1 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-ESC-104 | Basic Electrical Engineering | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-107 | Mathematics-I | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-BSC-111 | Semiconductor Physics Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-106 | Engineering Graphics and Design Lab | 0:0:4 | 4 | 2 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-109 | Basic Electrical Engineering Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-VAC-110 | IDEA Workshop | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| 10 | B23-VAC-112 | IDEA Project Workshop | 0:0:2 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| 11 | B23-HSC-102 | Design Thinking | 0:0:3 | 3 | 1.5 | - | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **30** | **23.5** | **350** | **570** | **180** | **1100** | **-** |

**Note:**

- NCC/NSS/Sports/Yoga/Technical/cultural club/society activities will be joined by students in first year and will be evaluated in 7th semester by the institute based upon continuous evaluation model as per guidelines.

## B.Tech. Computer Science and Engineering (CSE)

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER II

| S.No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester | Internal assessment | Practical Exam | Total | |
| 1 | B23-HSC-101 | English for Technical Writing | 2:0:0 | 2 | 2 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ESC-101 | Programming for Problem Solving | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-BSC-104 | Engineering Chemistry | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-BSC-108 | Mathematics-II | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-106 | Biology | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-HSC-103 | English Language Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-105 | Programming for Problem Solving Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-107 | Manufacturing Processes Workshop | 0:0:3 | 3 | 1.5 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-ESC-114 | Engineering Chemistry Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 10 | B23-VAC-101 | Personality Development and Soft Skills | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **26** | **20.5** | **350** | **410** | **240** | **1000** | |

## B.Tech. Computer Science and Engineering(CSE)

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER-III

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-CSE-201 | Data Structures and Algorithms | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | B23-CSE-203 | Computer Organization & Architecture | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | B23-CSE-205 | Object Oriented Programming | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 4 | B23-CSE-207 | IT Workshop (Python) | 2:0:0 | 2 | 2 | 70 | 30 | 0 | 100 | 3 |
| 5 | B23-BSC-203 | Probability and Statistics | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 6 | B23-HSM-201 | Organizational Behaviour | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 7 | B23-CSE-209 | Data Structures and Algorithms Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 8 | B23-CSE-211 | Object Oriented Programming Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 9 | B23-CSE-213 | IT Workshop (Python) Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 10 | B23-MAC-202 | Essence of Indian Traditional Knowledge | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **31** | **24** | **420** | **400** | **180** | **1000** | |

## B.Tech.Computer Science and Engineering(CSE)

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER-IV

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-CSE-202 | Advanced Programming (Java) | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | B23-ESC-212 | Digital Electronics | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | B23-CSE-204 | Design and Analysis Algorithms | 3:1:0 | 4 | 4 | 70 | 30 | 0 | 100 | 3 |
| 4 | B23-CSE-206 | Principles of Programming Languages | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 5 | B23-HSM-302 | Intellectual Property Rights (IPR) and Regulatory | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 6 | B23-CSE-208 | Advanced Programming Lab (Java) | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-214 | Digital Electronics Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 8 | B23-CSE-212 | Design & Analysis Algorithms Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 9 | B23-MAC-201 | Environmental Studies | 2:0:0 | 2 | 1 | -- | 100 | 0 | 100 | 3 |
| **TOTAL** | | | | **30** | **23** | **350** | **370** | **180** | **900** | |

**Note:**

- All students have to undertake the industrial training for 6 to 8 weeks after 4th semester which will be evaluated in 5th semester.

## B.Tech.Computer Science and Engineering(CSE)

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER-V

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-CSE-301 | Web and Internet Technology | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | B23-CSE-303 | Introduction to Database System | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | B23-CSE-305 | Machine Learning | 3:1:0 | 4 | 4 | 70 | 30 | 0 | 100 | 3 |
| 4 | B23-CSE-307 | Operating Systems | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 5 | B23-HSM-202 | Innovation, Startups and Entrepreneurship | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 6 | B23-CSE-309 | Web and Internet Technology Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 7 | B23-CSE-311 | Introduction to Database Systems Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 8 | B23-CSE-313 | Machine Learning Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 9 | B23-CSE-315 | Industrial Training-I | 0:0:0 | 0 | 0 | -- | 100 | -- | 100 | 3 |
| 10 | B23-VAC-302/304/306/308/310 | Hindi Language Skills/ Sanskrit Language Skills/ German Language Skills/ Japanese Language Skills/ French Language Skills | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **30** | **23** | **350** | **470** | **180** | **1000** | |

**Note:**

- B23-CSE-315 is a mandatory non-credit course in which the students will be required to get passing marks.

## B. Tech. Computer Science and Engineering(CSE)

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER-VI

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-CSE-302 | Computer Networks | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | B23-CSE-304 | Big Data Analytics and Visualization | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | -- | Program Elective-I | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 4 | -- | Program Elective-II | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 5 | B23-CSE-306 | Software Engineering | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 6 | B23-CSE-308 | Computer Networks Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 7 | B23-CSE-310 | Big Data Analytics and Visualization Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 8 | B23-CSE-312 | Project-1 | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 9 | B23-MAC-301 | Constitution of India | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **29** | **22** | **350** | **370** | **180** | **900** | |

**Note:**

- ThecourseofbothProgramElectiveandOpenElectivewillbeofferedat1/3rdstrengthor20students(whicheverissmaller)ofthesection.
- All students have to undertake the industrial training for 6 to 8 weeks after 6th semester which will be evaluated in 7th semester.

| **Program Elective-I** | | **Program Elective-II** | |
|---|---|---|---|
| Android and Mobile App Development | B23-PEC-314 | Automata Theory | B23-PEC-320 |
| Deep Learning | B23-PEC-316 | Compiler Design | B23-PEC-322 |
| Natural Language Processing | B23-PEC-318 | Theory of Computation | B23-PEC-324 |

## B.Tech.Computer Science and Engineering(CSE)
## KURUKSHETRA UNIVERSITY, KURUKSHETRA
SEMESTER-VII

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-CSE-401 | Cloud Computing | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | -- | Program Elective-III | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | -- | Open Elective-I | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 4 | B23-CSE-403 | Unix and Linux programming | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 5 | B23-CSE-405 | Cloud Computing Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 6 | B23-CSE-407 | Unix and Linux Programming Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 7 | B23-CSE-409 | Project-II | 0:0:8 | 8 | 4 | 0 | 40 | 60 | 100 | 3 |
| 8 | B23-CSE-411 | Industrial Training-II | 0:0:0 | 0 | 0 | -- | 100 | -- | 100 | 3 |
| 9 | B23-VAC-401/403/405/407/409/411 | NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/Society activities | 0:0:2 | 2 | 1 | -- | 100 | -- | 100 | -- |
| **TOTAL** | | | | **30** | **21** | **280** | **440** | **180** | **900** | |

**Note:**

- **The** course of both Program Elective and Open Elective will be offered at1/3rd strength or 20 students(whichever is smaller)of the section.
- B23-CSE-411 is a mandatory non-credit course in which the students will be required to get passing marks
- B23-VAC-401/403/405/407/409/411 are single credit value added courses in which NCC/NSS/Sports/Yoga/Technical or Cultural Club/Society activities will be joined by students in first year and will be evaluated in 7th semester by the institute based upon continuous evaluation model as per guidelines**.**

| **Program Elective-III** | | **Open Elective-I** | |
|---|---|---|---|
| Soft Computing | B23-PEC-413 | Cyber Law and Ethics | B23-OEC-419 |
| Neural network and Fuzzy logic | B23-PEC-415 | International and Corporate Law | B23-OEC-421 |
| Simulation and Modelling | B23-PEC-417 | Internet of Things | B23-OEC-423 |
| | | Bioinformatics | B23-OEC-425 |

## B.Tech.Computer Science and Engineering(CSE)

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER-VIII

| S. No. | Course No./Code | Subject | L:T:P | Hours/ Week | Credits | ExaminationSchedule(Marks) | | | | Duration ofexam(Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | -- | Program Elective-IV | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | -- | Program Elective-V | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | B23-CSE-402 | Project-III / Industrial Project/ Research Lab/ /Start ups / Entrepreneurship | 0:0:20 | 20 | 10 | | 200 | 200 | 400 | 3 |
| **TOTAL** | | | | **26** | **16** | **140** | **260** | **200** | **600** | |

**Note:**

- ThecourseofbothProgramElectiveandOpenElectivewillbeofferedat1/3rdstrengthor20students(which ever is smaller) of the section.
- In case of semester-long project work done in industry/external institute, the Program Elective- IV and Open Elective-IV may be offered in online mode through MOOC courses offered by SWAYAM/NPTEL portal. These courses may be done from 3rd semester till completion of the degree.

| **Program Elective -IV** | **Program Elective -V** |
|---|---|
| Agile Software Engineering B23-PEC-404 | Social Networks B23-PEC -410 |
| Software Verification, Validation and Testing B23-PEC -406 | AI and Robotics B23-PEC -412 |
| Software Project Management B23-PEC-408 | Block Chain Technology B23-PEC -414 |
| | Health Care and Analytics B23-PEC -416 |

**Computer Science and Engineering**

Students of Computer Science and Engineering are offered to earn **ADDITIONAL 18-20 CREDITS** through MOOCs/SWAYAM courses as per the 'Guidelines to implement the SWAYAM/MOOCs/ other authorized online courses (OAOC) of Kurukshetra University, Kurukshetra' in any of the emerging areas mentioned below for the award of the degree of:

1. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Artificial Intelligence and Machine Learning.**
2. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Blockchain.**
3. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Data Science.**
4. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Internet of Things (IoT).**
5. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Cyber Security.**
6. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Software Engineering.**
7. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Agile Software.**
8. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Software Validation, Verification and Testing.**
9. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Smart Healthcare.**
10. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Cloud Computing.**
11. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Big Data Analytic.**
12. **B.Tech. (Hons.) Computer Science and Engineering with Specialization in Data Security and Cryptography.**
13. **B.Tech. Computer Science and Engineering with Minor Degree in 3D Printing.**
14. **B.Tech. Computer Science and Engineering with Minor Degree in Electric Vehicles.**
15. **B.Tech. Computer Science and Engineering with Minor Degree in Energy .Engineering.**
16. **B.Tech. Computer Science and Engineering with Minor Degree in Robotics.**
17. **B.Tech. Computer Science and Engineering with Minor Degree in Mechatronics.**
18. **B.Tech. Computer Science and Engineering with Minor Degree in Computer Science and Biology.**
19. **B.Tech. Computer Science and Engineering with Minor Degree in Drug Engineering.**
20. **B.Tech. Computer Science and Engineering with Minor Degree in Genome Engineering and Technology.**

# KURUKSHETRA UNIVERSITY, KURUKSHETRA

*(ESTABLISHED BY THE STATE LEGISLATURE ACT XII OF 1956)*
*('A+' GRADE NAAC ACCREDITED)*

# Scheme & Syllabus
# of
# B.Tech. Degree
# in
# Computer Science and Engineering
# (Artificial Intelligence and Machine Learning)

**(w.e.f. session 2023-24 onwards)**

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# GENERAL COURSE STRUCTURE & CREDIT DISTRIBUTION

## GENERAL COURSE STRUCTURE & THEME

**A. Definition of Credit***:

| | |
|---|---|
| 1Hr. Lecture(L) per week | 1Credit |
| 1Hr.Tutorial(T)per week | 1Credit |
| 1Hr.Practical(P)per week | 0.5Credit |
| 2HoursPractical(P)per week | 1Credit |

*Except for mandatory and value added courses

**B. Range of Credits:** The total number of credits proposed for the four-year B.Tech. degree in Computer Science and Engineering (Artificial Intelligence and Machine Learning) is kept as 172. In addition to this, for B.Tech. with Honors & specialization/minor degree, the student has to acquire additional 18-20 credits through MOOC courses offered at SWAYAM/NPTEL portal.

**C. Structure of UG Program in** Computer Science and Engineering (Artificial Intelligence and Machine Learning)**:**The structure of UG program in Computer Science and Engineering (Artificial Intelligence and Machine Learning)has essentially the following categories of courses with the breakup of credits as given:

| Sr. No. | Category | Credit Breakup for CAM |
|---|---|---|
| 1 | Humanities and Social Sciences including Management courses | 7.5 |
| 2 | Basic Science courses | 23 |
| 3 | Engineering Science courses including workshop, drawing, basics of electronics/ electrical/mechanical/computer etc. | 16.5 |
| 4 | Professional core courses | 81 |
| 5 | Program Elective courses relevant to chosen specialization/branch | 15 |
| 6 | Open subjects–Electives from other technical and/or emerging subjects | 06 |
| 7 | Project work, seminar and internship in industry or else where | 16 |
| 8 | Mandatory and Audit Courses<br>[IDEA Workshop, IDEA Workshop Lab, Personality Development and Soft Skills, Environmental Studies, Induction Program, Constitution of India, Essence of Indian Knowledge Tradition, NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/ Society Activities] | 07 |
| | **Total** | **172** |

**D. Course code and definition:**

| Course code | Definitions |
|---|---|
| L:T:P | Lecture: Tutorial: Practical |
| BSC | Basic Science Courses |
| ESC | Engineering Science Courses |
| HSC/HSM | Humanities and Social Sciences including Management courses |
| CAM | Program Core Courses |
| PCA | PROFESSIONAL Elective Courses |
| OCA | Open Elective Courses |
| VAC | Value Added Courses |
| MAC | Mandatory Courses |

➢ **Category-wise Courses**

## HUMANITIES & SOCIALSCIENCE SCOURSES [HSC/HSM]

| S.No | Course No./ Code | Subject | Semester | Hrs/week | | | Credits |
|---|---|---|---|---|---|---|---|
| | | | | Lecture | Tutorial | Practical | |
| 1 | B23-HSC-101 | English for Technical Writing | II | 2 | 0 | 2 | 3 |
| 2 | B23-HSM-101 | Universal Human Values-II: Understanding Harmony And Ethical Human Conduct | I | 3 | 0 | 0 | 3 |
| 3 | B23-HSC-102 | Design Thinking | I | 0 | 0 | 3 | 1.5 |
| **Total Credits** | | | | | | | **7.5** |

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## BASIC SCIENCE COURSES [BSC]

| S. No | Course No./ Code | Subject | Semester | Hrs/week | | | Credits |
|---|---|---|---|---|---|---|---|
| | | | | Lecture | Tutorial | Practical | |
| 1 | B23-BSC-101 | Semiconductor Physics | I | 3 | 1 | 2 | 5 |
| 2 | B23-BSC-107 | Mathematics-I | I | 3 | 1 | 0 | 4 |
| 3 | B23-BSC-104 | Engineering Chemistry | II | 3 | 0 | 2 | 4 |
| 4 | B23-BSC-108 | Mathematics-II | II | 3 | 1 | 0 | 4 |
| 5 | B23-BSC-106 | Biology | II | 3 | 0 | 0 | 3 |
| 6 | B23-BSC-205 | Mathematical Concepts for AI | III | 3 | 0 | 0 | 3 |
| **Total Credits** | | | | | | | **23** |

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## ENGINEERING SCIENCE COURSE[ESC]

| S. No | Course No./ Code | Subject | Semester | Hrs/week | | | Credits |
|---|---|---|---|---|---|---|---|
| | | | | Lecture | Tutorial | Practical | |
| 1 | B23-ESC-104 | Basic Electrical Engineering | I | 3 | 1 | 2 | 5 |
| 2 | B23-ESC-102 | Engineering Graphics and Design | I | 1 | 0 | 4 | 3 |
| 3 | B23-ESC-101 | Programming for Problem Solving | II | 3 | 0 | 2 | 4 |
| 4 | B23-ESC-107 | Manufacturing Processes Workshop | II | 0 | 0 | 3 | 1.5 |
| 5 | B23-ESC-220 | Internet of Things | IV | 3 | 0 | 0 | 3 |
| **Total Credits** | | | | | | | **16.5** |

**PROGRAM CORE COURSES[CAM]**

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-CAM-201 | Data Structures | III | 3:0:0 | 3 |
| 2 | B23-CAM-203 | Modern Computer Architecture | III | 3:0:0 | 3 |
| 3 | B23-CAM-205 | Object Oriented Programming | III | 3:0:0 | 3 |
| 4 | B23-CAM-207 | IT Workshop (Python) | III | 2:0:0 | 2 |
| 5 | B23-CAM-209 | Artificial Intelligence | III | 3:0:0 | 3 |
| 6 | B23-CAM-211 | Data Structures Lab | III | 0:0:4 | 2 |
| 7 | B23-CAM-213 | Object Oriented Programming Lab | III | 0:0:4 | 2 |
| 8 | B23-CAM-215 | IT Workshop (Python) Lab | III | 0:0:4 | 2 |
| 9 | B23-CAM-202 | Introduction to Machine Learning | IV | 3:0:0 | 3 |
| 10 | B23--CAM-206 | Design and Analysis Algorithms | IV | 3:1:0 | 4 |
| 11 | B23--CAM-208 | Data Base System | IV | 3:0:0 | 3 |
| 12 | B23--CAM-210 | Machine Learning Lab | IV | 0:0:4 | 2 |
| 13 | B23--CAM-212 | Design & Analysis Algorithms Lab | IV | 0:0:4 | 2 |
| 14 | B23--CAM-214 | DBS Lab | IV | 0:0:4 | 2 |
| 15 | B23--CAM-301 | Web and Internet Technology | V | 3:0:0 | 3 |
| 16 | B23--CAM-303 | Interactive Computer Graphics | V | 3:0:0 | 3 |
| 17 | B23--CAM-305 | Advance Machine Learning | V | 3:1:0 | 4 |
| 18 | B23--CAM-307 | Operating Systems | V | 3:0:0 | 3 |
| 19 | B23--CAM-309 | Web and Internet Technology Lab | V | 0:0:4 | 2 |
| 20 | B23--CAM-311 | ICG Lab | V | 0:0:4 | 2 |
| 21 | B23--CAM-313 | Machine Learning Lab-II | V | 0:0:4 | 2 |
| 22 | B23--CAM-315 | Industrial Training-I | V | 0:0:0 | 0 |
| 23 | B23--CAM-302 | Computer Networks | VI | 3:0:0 | 3 |
| 24 | B23--CAM-304 | Big Data Analytics | VI | 3:0:0 | 3 |
| 25 | B23--CAM-306 | Optimization Techniques in Machine Learning | VI | 3:0:0 | 3 |
| 26 | B23--CAM-308 | Computer Networks Lab | VI | 0:0:4 | 2 |
| 27 | B23--CAM-310 | Big Data Analytics Lab | VI | 0:0:4 | 2 |
| 28 | B23--CAM-401 | Cloud Computing | VII | 3:0:0 | 3 |
| 29 | B23--CAM-403 | Soft Computing | VII | 3:0:0 | 3 |
| 30 | B23--CAM-405 | Software Engineering | VII | 3:0:0 | 3 |
| 31 | B23--CAM-407 | Cloud Computing Lab | VII | 0:0:4 | 2 |
| 32 | B23--CAM-409 | Soft Computing Lab | VII | 0:0:4 | 2 |
| 33 | B23--CAM-413 | Industrial Training-II | VII | 0:0:0 | 0 |
| **Total** | | | | | **81** |

## SKILL ENHANCEMENT BASED PROJECTWORK,SEMINAR AND INTERNSHIP

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-CAM-312 | Project-I | VI | 0:0:4 | 2 |
| 2 | B23-CAM-411 | Project-II | VII | 0:0:8 | 4 |
| 3 | B23-CAM-402 | Project-III / Industrial Project/ Research Lab/ /Start ups / Entrepreneurship | VIII | 0:0:20 | 10 |
| 4 | B23-CAM-315 | Industrial Training-I | V | 0:0:0 | 0 |
| 5 | B23-CAM-413 | Industrial Training-II | VII | 0:0:0 | 0 |
| **Total** | | | | | **16** |

## PROFESSIONAL ELECTIVES[PCA]

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | | PCA-I | **PROFESSIONAL ELECTIVE-I** | VI | 3:0:0 |
| 2 | | PCA-II | **PROFESSIONAL ELECTIVE-II** | VI | 3:0:0 |
| 3 | | PCA-III | **PROFESSIONAL ELECTIVE-III** | VII | 3:0:0 |
| 4 | | PCA-IV | **PROFESSIONAL LECTIVE- IV** | VIII | 3:0:0 |
| 5 | | PCA-V | **PROFESSIONAL ELECTIVE-V** | VIII | 3:0:0 |
| **Total** | | | | | **15** |

## LIST OFPROFESSIONAL ELECTIVE COURSES [PCA]

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-PCA-314 | Android and Mobile App Development | VI | 3:0:0 | 3 |
| 2 | B23- PCA-316 | Data and Visual Analytics in AI | VI | 3:0:0 | 3 |
| 3 | B23- PCA-318 | Natural Language Processing | VI | 3:0:0 | 3 |
| 4 | B23- PCA-320 | Image and Video Processing | VI | 3:0:0 | 3 |
| 5 | B23- PCA-322 | Deep Learning | VI | 3:0:0 | 3 |
| 6 | B23- PCA-324 | Data Mining | VI | 3:0:0 | 3 |
| 7 | B23- PCA-415 | Machine Learning for Data Science | VII | 3:0:0 | 3 |
| 8 | B23- PCA-417 | Unix and Linux Programming | VII | 3:0:0 | 3 |
| 9 | B23- PCA-419 | Simulation and Modelling | VII | 3:0:0 | 3 |
| 10 | B23- PCA-404 | Agile Software Engineering | VIII | 3:0:0 | 3 |
| 11 | B23- PCA-406 | Software Verification, Validation and Testing | VIII | 3:0:0 | 3 |
| 12 | B23- PCA-408 | Software Project Management | VIII | 3:0:0 | 3 |
| 13 | B23- PCA410 | Social Networks | VIII | 3:0:0 | 3 |
| 14 | B23- PCA-412 | AI and Robotics | VIII | 3:0:0 | 3 |
| 15 | B23- PCA-414 | Neural Network and Fuzzy Logic | VIII | 3:0:0 | 3 |
| 16 | B23- PCA-416 | Health Care and Analytics | VIII | 3:0:0 | 3 |

**OPEN ELECTIVES[OCA]**

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | | OCA-1 | **OPEN ELECTIVE-I** | 3:0:0 | IV |
| 2 | | OCA-II | **OPEN ELECTIVE-II** | 3:0:0 | V |
| **Total** | | | | | **6** |

**LIST OF OPEN ELECTIVE COURSES [OCA]**

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-OCA-202 | Intellectual Property Rights (IPR) and Regulatory | IV | 3:0:0 | 3 |
| 2 | B23-OCA-204 | International and Corporate Law | IV | 3:0:0 | 3 |
| 3 | B23-OCA-206 | Cyber Law and Ethics- | IV | 3:0:0 | 3 |
| 4 | B23-OCA-301 | Digital Electronics | V | 3:0:0 | 3 |
| 5 | B23-OCA-303 | Innovation, Start ups and Entrepreneurship | V | 3:0:0 | 3 |
| 6 | BC23-OCA-305 | Bioinformatics | V | 3:0:0 | 3 |

**VALUE ADDED AND MANDATORY COURSES [VAC/MAC]**

| S. No. | Course No./ Code | Subject | Semester | Hrs/Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-VAC-101 | Personality Development and Soft Skills | II | 2:0:0 | 1 |
| 2 | B23-VAC-110 | IDEA Workshop | I | 2:0:0 | 1 |
| 3 | B23-VAC-112 | IDEA Project Workshop | I | 0:0:2 | 1 |
| 4 | B23-VAC-401/403/405/407/409/411 | NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/Society activities | VII | 0:0:2 | 1 |
| 5 | B23-MAC-201 | Environmental Studies | IV | 2:0:0 | 1 |
| 6 | B23-MAC-202 | Essence of Indian Traditional Knowledge | III | 2:0:0 | 1 |
| 7 | B23-MAC-301 | Constitution of India | V | 2:0:0 | 1 |
| **Total** | | | | | **7** |

# SEMESTER WISE STRUCTURE

## *B.*Tech. Computer Science and Engineering (Artificial Intelligence and Machine Learning)

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER I

| S.No. | Course No./Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical exam | Total | |
| 1 | B23-BSC-101 | Semiconductor Physics | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-HSM-101 | Universal Human Values-II: Understanding Harmony and Ethical Human conduct | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ESC-102 | Engineering Graphics and Design | 1:0:0 | 1 | 1 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-ESC-104 | Basic Electrical Engineering | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-107 | Mathematics-I | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-BSC-111 | Semiconductor Physics Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-106 | Engineering Graphics and Design Lab | 0:0:4 | 4 | 2 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-109 | Basic Electrical Engineering Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-VAC-110 | IDEA Workshop | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| 10 | B23-VAC-112 | IDEA Project Workshop | 0:0:2 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| 11 | B23-HSC-102 | Design Thinking | 0:0:3 | 3 | 1.5 | - | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **30** | **23.5** | **350** | **570** | **180** | **1100** | **-** |

**Note:**

- NCC/NSS/Sports/Yoga/Technical/cultural club/society activities will be joined by students in first year and will be evaluated in 7th semester by the institute based upon continuous evaluation model as per guidelines.

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### SEMESTER II

| S.No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester | Internal assessment | Practical Exam | Total | |
| 1 | B23-HSC-101 | English for Technical Writing | 2:0:0 | 2 | 2 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ESC-101 | Programming for Problem Solving | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-BSC-104 | Engineering Chemistry | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-BSC-108 | Mathematics-II | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-106 | Biology | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-HSC-103 | English Language Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-105 | Programming for Problem Solving Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-107 | Manufacturing Processes Workshop | 0:0:3 | 3 | 1.5 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-ESC-114 | Engineering Chemistry Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 10 | B23-VAC-101 | Personality Development and Soft Skills | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **26** | **21.5** | **350** | **410** | **240** | **1000** | |

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### SEMESTER-III

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-CAM-201 | Data Structures | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | B23-CAM-203 | Modern Computer Architecture | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | B23-CAM-205 | Object Oriented Programming | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 4 | B23-CAM-207 | IT Workshop (Python) | 2:0:0 | 2 | 2 | 70 | 30 | 0 | 100 | 3 |
| 5 | B23-BSC-205 | Mathematical Concepts for AI | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 6 | B23-CAM-209 | Artificial Intelligence | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 7 | B23-CAM-211 | Data Structures Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 8 | B23-CAM-213 | Object Oriented Programming Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 9 | B23-CAM-215 | IT Workshop (Python) Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 10 | B23-MAC-202 | Essence of Indian Traditional Knowledge | **2:0:0** | **2** | **1** | **--** | **100** | **0** | **100** | **3** |
| **TOTAL** | | | | **31** | **24** | **420** | **400** | **180** | **1000** | |

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### SEMESTER-IV

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-CAM-202 | Introduction to Machine Learning | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | B23-ESC-220 | Internet of Things | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | B23-CAM-206 | Design and Analysis Algorithms | 3:1:0 | 4 | 4 | 70 | 30 | 0 | 100 | 3 |
| 4 | B23-CAM-208 | Data Base System | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 5 | -- | Open Elective-I | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 6 | B23-CAM-210 | Machine Learning Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 7 | B23-CAM-212 | Design & Analysis Algorithms Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 8 | B23-CAM-214 | DBS Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 9 | B23-MAC-201 | Environmental Studies | 2:0:0 | 2 | 1 | -- | 100 | 0 | 100 | 3 |
| **TOTAL** | | | | **30** | **23** | **350** | **370** | **180** | **900** | |

**Note:**

- All students have to undertake the industrial training for 6 to 8 weeks after 4th semester which will be evaluated in 5th semester.
- The course of Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.

| **Open Elective –I** | |
|---|---|
| Intellectual Property Rights (IPR) and Regulatory | B23-OCA-202 |
| International and Corporate Law | OE23-OCA-204 |
| Cyber Law and Ethics- | OE23-OCA-206 |

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### SEMESTER-V

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-CAM-301 | Web and Internet Technology | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | B23-CAM-303 | Interactive Computer Graphics | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | B23-CAM-305 | Advance Machine Learning | 3:1:0 | 4 | 4 | 70 | 30 | 0 | 100 | 3 |
| 4 | B23-CAM-307 | Operating Systems | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 5 | --- | Open Elective-II | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 6 | B23-CAM-309 | Web and Internet Technology Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 7 | B23-CAM-311 | ICG Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 8 | B23-CAM-313 | Machine Learning Lab-II | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 9 | B23-CAM-315 | Industrial Training-I | 0:0:0 | 0 | 0 | -- | 100 | -- | 100 | 3 |
| 10 | B23-MAC-301 | Constitution of India | 2:0:0 | 2 | 1 | -- | 100 | 0 | 100 | 3 |
| **TOTAL** | | | | **30** | **23** | **350** | **470** | **180** | **1000** | |

**Note:**

- B23-CAM-315 is a mandatory non-credit course in which the students will be required to get passing marks.
- ThecourseofbothProgramElectiveandOpenElectivewillbeofferedat1/3rdstrengthor20students(whichever is smaller)of the section.

| **Open Elective-II** | |
|---|---|
| Digital Electronics | B23-OCA-301 |
| Innovation, Start-ups and Entrepreneurship | B23-OCA-303 |
| Bioinformatics | B23-OCA-305 |

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### SEMESTER-VI

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-CAM-302 | Computer Networks | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | B23-CAM-304 | Big Data Analytics | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | --- | Professional Elective-I | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 4 | --- | Professional Elective-II | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 5 | B23-CAM-306 | Optimization Techniques in Machine Learning | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 6 | B23-CAM-308 | Computer Networks Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 7 | B23-CAM-310 | Big Data Analytics Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 8 | B23-CAM-312 | Project-I | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| **TOTAL** | | | | **27** | **21** | **350** | **270** | **180** | **800** | |

**Note:**

- ThecourseofbothProfessionalElectiveandOpenElectivewillbeofferedat1/3rdstrength or20 students(whichever is smaller)of the section.
- All students have to undertake the industrial training for 6 to 8 weeks after 6th semester which will be evaluated in 7th semester.

| **Professional Elective-I** | **Professional Elective-II** |
|---|---|
| Android and Mobile App Development B23-PCA-314 | Image and Video ProcessingB23-PCA-320 |
| Data and Visual Analytics in AIB23-PCA-316 | Deep Learning B23-PCA-322 |
| Natural Language Processing B23-PCA-318 | Data Mining B23-PCA-324 |

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SEMESTER-VII

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration ofexam |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | B23-CAM-401 | Cloud Computing | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | -- | Professional Elective-III | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | B23-CAM-403 | Soft Computing | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 4 | B23-CAM-405 | Software Engineering | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 5 | B23-CAM-407 | Cloud Computing Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 6 | B23-CAM-409 | Soft Computing Lab | 0:0:4 | 4 | 2 | 0 | 40 | 60 | 100 | 3 |
| 7 | B23-CAM-411 | Project-II | 0:0:8 | 8 | 4 | 0 | 100 | 100 | 200 | 3 |
| 8 | B23-CAM-413 | Industrial Training-II | 0:0:0 | 0 | 0 | -- | 100 | -- | 100 | 3 |
| 9 | B23-VAC-401/403/405/407/409 | NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/Society activities | | -- | 1 | | 100 | -- | 100 | |
| **TOTAL** | | | | **28** | **21** | **280** | **500** | **220** | **1000** | |

**Note:**

- **Th**ecourseofbothProgramElectiveandOpenElectivewillbeofferedat1/3rdstrength or20 students(whichever is smaller) of the section.
- B23-CAM-413 is a mandatory non-credit course in which the students will be required to get passing marks
- B23-VAC-401/403/405/407/409/411 are single credit value added courses in which NCC/NSS/Sports/Yoga/Technical or Cultural Club/Society activities will be joined by students in first year and will be evaluated in 7th semester by the institute based upon continuous evaluation model as per guidelines**.**

| **Professional Elective-III** | |
|---|---|
| Machine Learning for Data Science | B23-PCA-415 |
| Unix and Linux Programming | B23-PCA-417 |
| Simulation and Modelling | B23-PCA-419 |

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### SEMESTER-VIII

| S. No. | Course No./Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration Of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical Exam | Total | |
| 1 | -- | Professional Elective-IV | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 2 | -- | Professional Elective-V | 3:0:0 | 3 | 3 | 70 | 30 | 0 | 100 | 3 |
| 3 | B23-CAM-402 | Project-III / Industrial Project/ Research Lab/ /Start ups / Entrepreneurship | 0:0:20 | 20 | 10 | | 200 | 200 | 400 | 3 |
| **TOTAL** | | | | **26** | **16** | **140** | **260** | **200** | **600** | |

**Note:**

- ThecourseofbothProfessionalElectivewillbeofferedat1/3rdstrength or 20 students(whichever is smaller)of the section.
- In case of semester-long project work done in industry/external institute, the Program Elective- IV and Open Elective-IV may be offered in online mode through MOOC courses offered by SWAYAM/NPTEL portal. These courses may be done from 3rd semester till completion of the degree.
- In case of semester-long project work done in industry the Program Elective- IV and Programme Elective-V may be offered in online mode through MOOC courses offered by SWAYAM/NPTEL

| **Professional Elective -IV** | | **Professional Elective -V** | |
|---|---|---|---|
| Agile Software Engineering | B23-PCA-404 | Social Networks | B23-PCA-410 |
| Software Verification, Validation and Testing | B23-PCA-406 | AI and Robotics | B23-PCA-412 |
| Software Project Management | B23-PCA-408 | Neural Network and Fuzzy Logic | B23-PCA-414 |
| | | Health Care and Analytics | B23-PCA-416 |

***KURUKSHETRA UNIVERSITY, KURUKSHETRA***

***(ESTABLISHED BY THE STATE LEGISLATURE ACT XII OF 1956)***

***('A+' GRADE NAAC ACCREDITED)* in**

# Scheme & Syllabus
# of
# B. Tech. Degree
# in
# Mechanical Engineering (ME)

## GENERAL COURSE STRUCTURE & THEME

### A. Definition of Credit*:

| | |
|---|---|
| 1 Hr. Lecture (L) per week | 1 Credit |
| 1 Hr. Tutorial (T) per week | 1 Credit |
| 1 Hr. Practical (P) per week | 0.5 Credit |
| 2 Hours Practical (P) per week | 1 Credit |

* Except for mandatory and value added courses.

**B. Range of Credits:** The total number of credits proposed for the four-year B.Tech. degree in Mechanical Engineering is kept as 172. In addition to this, for B.Tech. with Honors & specialization/minor degree, the student has to acquire additional 18-20 credits through MOOC courses offered at SWAYAM/NPTEL portal.

### C. Structure of UG Program in ME:

The structure of UG program in Mechanical Engineering is having the following categories of courses with the breakup of credits as given:

| S. No. | Category | Breakup of Credits (Total 172) |
|---|---|---|
| 1 | Humanities and Social Sciences including Management courses | 13.5 |
| 2 | Basic Science courses | 28 |
| 3 | Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc. | 24.5 |
| 4 | Professional core courses | 69 |
| 5 | Professional Elective courses relevant to chosen Specialization/ branch | 12 |
| 6 | Open subjects – Electives from other technical and /or emerging subjects | 6 |
| 7 | Project work, seminar and internship in industry or elsewhere | 11 |
| 8 | Value Added and Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution, Essence of Indian Knowledge Tradition], [IDEA Workshop, Personality Development and Soft Skills, National/ International languages, NCC/NSS/Yoga/Sports/Technical and cultural activities] | 8 (1 for each course) |
| | **Total** | **172** |

## D. Course code and definition:

| Course code | Definitions |
|---|---|
| L | Lecture |
| T | Tutorial |
| P | Practical |
| C | Credits |
| BSC | Basic Science Courses |
| ESC | Engineering Science Courses |
| HSC/HSM | Humanities and Social Sciences including Management courses |
| MEC | Program core courses |
| MEP | Professional Elective courses |
| MEO | Open Elective courses |
| VAC | Value Added Courses |
| MAC | Mandatory Courses |

### CATEGORY-WISE COURSES:
### HUMANITIES & SOCIAL SCIENCES COURSES [HSC/HSM]

| S. No | Code No. | Subject | Semester | Credits |
|---|---|---|---|---|
| 1 | B23-HSC-101 | English for Technical Writing | I | **2:0:2=3** |
| 2 | B23-HSC-102 | Design Thinking | II | **0:0:3=1.5** |
| 3 | B23-HSM-101 | Universal Human Values- II: Understanding Harmony And Ethical Human Conduct | II | **3:0:0=3** |
| 4 | B23-HSM-202 | Innovation, Start- up and Entrepreneurship | IV | **3:0:0=3** |
| 5 | B23-HSM-201 | Organizational Behaviour | V | **3:0:0=3** |
| | | | **Total** | **13.5** |

### BASIC SCIENCE COURSES [BSC]

| S. No | CodeNo. | Subject | Semester | Credits |
|---|---|---|---|---|
| 1 | B23-BSC-104 | Engineering Chemistry | I | **3:0:2=4** |
| 2 | B23-BSC-107 | Mathematics-I | I | **3:1:0=4** |
| 3 | B23-BSC-106 | Biology | I | **3:0:0=3** |
| 4 | B23-BSC-102 | Introduction to Electromagnetic Theory | II | **3:1:2=5** |
| 5 | B23-BSC-108 | Mathematics-II | II | **3:1:0=4** |
| 6. | B23-BSC-203 | Mathematics-III | III | **3:1:0=4** |
| 7. | B23-BSC-201 | Oscillations, Waves and Optics | III | **3:1:0=4** |
| | | | **Total** | **28** |

## ENGINEERING SCIENCE COURSE [ESC]

| S. No | CodeNo. | Subject | Semester | Credits |
|---|---|---|---|---|
| 1 | B23-ESC-101 | Programming for Problem Solving | I | **3:0:2=4** |
| 2 | B23-ESC-107 | Manufacturing Processes Workshop | I | **0:0:3=1.5** |
| 3 | B23-ESC-103 | Basic Electrical and Electronics Engineering | I | **3:1:2=5** |
| 4 | B23-ESC-102 | Engineering Graphics and Design | II | **1:0:4=3** |
| 5 | B23-ESC -201 | Engineering Thermodynamics | III | **3:1:0=4** |
| 6. | B23-ESC -203 | Measurement and Control | III | **3:0:0=3** |
| 7. | B23-ESC -202 | Materials Engineering | IV | **3:0:2=4** |
| **Total** | | | | **24.5** |

## PROGRAM CORE COURSES [MEC]

| S. No | CodeNo. | Subject | Semester | Credits |
|---|---|---|---|---|
| 1 | B23-MEC-201 | Theory of Machines | III | **3:1:2=5** |
| 2 | B23-MEC-203 | Mechanics of Solids-I | III | **3:1:2=5** |
| 3 | B23-MEC-202 | Fluid Mechanics and Machines | IV | **4:1:2=6** |
| 4 | B23-MEC-204 | Mechanical Vibrations and Tribology | IV | **3:1:2=5** |
| 5 | B23-MEC-206 | Mechanics of Solids-II | IV | **3:1:0=4** |
| 6. | B23-MEC-208 | Manufacturing Technology | IV | **3:0:0=3** |
| 7. | B23-MEC-301 | Heat Transfer | V | **3:1:2=5** |
| 8 | B23-MEC-303 | Production Technology | V | **3:0:2=4** |
| 9 | B23-MEC-305 | Mechatronics | V | **3:0:2=4** |
| 10 | B23-MEC-307 | Design of Machine Elements | V | **2:4:0=6** |
| 11 | B23-MEC-302 | Production and Operation Management | VI | **3:0:0=3** |
| 12 | B23-MEC-304 | Computer Aided Design and Manufacturing | VI | **3:0:2=4** |
| 13 | B23-MEC-306 | Refrigeration and Air-conditioning | VI | **3:1:2=5** |
| 14 | B23-MEC-308 | Internal Combustion Engines | VI | **3:0:0=3** |
| 15 | B23-MEC-401 | Automobile Engineering | VII | **3:0:0=3** |
| 16 | B23-MEC-403 | Python for Mechanical Engineering | VII | **3:0:2=4** |
| | | | **Total** | **69** |

## SKILL ENHANCEMENT BASED PROJECT WORK, SEMINAR AND INTERNSHIP

| S. No | Code No. | Subject | Semester | Credits |
|---|---|---|---|---|
| 1 | B23-MEC-310 | Project-I | IV | **0:0:4=2** |
| 2 | B23-MEC-405 | Project-II | VII | **0:0:8=4** |
| 3 | B23-MEC-402 /404/406/408 | Project-IV/ Industrial Training/ Entrepreneurship/ Start-up | VIII | **0:0:10=5** |
| | | | **Total** | **11** |

## PROGRAMME ELECTIVES [MEP]

| Sr. No. | Subject | Semester | Credits |
|---|---|---|---|
| 1 | PROGRAMME ELECTIVE-I | VI | **3:0:0=3** |
| 2 | PROGRAMME ELECTIVE-II | VI | **3:0:0=3** |
| 3 | PROGRAMME ELECTIVE-III | VII | **3:0:0=3** |
| 4 | PROGRAMME ELECTIVE-IV | VIII | **3:0:0=3** |
| | Total | | **12** |

## LIST OF PROGRAMME ELECTIVE COURSES

| S.No | Code No. | Subject | Semester | Credits |
|---|---|---|---|---|
| 1 | B23-MEP-302 | Renewable Energy Resources | VI | **3:0:0=3** |
| 2 | B23-MEP-304 | Smart Materials | VI | **3:0:0=3** |
| 3 | B23-MEP-306 | Industry 4.0 | VI | **3:0:0=3** |
| 4 | B23-MEP-308 | Welding Technology | VI | **3:0:0=3** |
| 5 | B23-MEP-310 | Theory of Elasticity and Plasticity | VI | **3:0:0=3** |
| 6 | B23-MEP-312 | Industrial Robotics | VI | **3:0:0=3** |
| 7 | B23-MEP-314 | Optimization Techniques | VI | **3:0:0=3** |
| 8 | B23-MEP-316 | Design of Transmission Systems | VI | **3:0:0=3** |
| 9 | B23-MEP-318 | Non-Conventional Machining | VI | **3:0:0=3** |
| 10 | B23-MEP-320 | Power Plant Engineering | VI | **3:0:0=3** |
| 11 | B23-MEP-322 | Acoustics and Noise Control | VI | **3:0:0=3** |
| 12 | B23-MEP-324 | Product Design and Development | VI | **3:0:0=3** |
| 13 | B23-MEP-401 | Manufacturing Automation | VII | **3:0:0=3** |
| 14 | B23-MEP-403 | Finite Element Analysis | VII | **3:0:0=3** |
| 15 | B23-MEP-405 | Air-conditioning System Design | VII | **3:0:0=3** |
| 16 | B23-MEP-407 | Non-destructive Testing | VII | **3:0:0=3** |
| 17 | B23-MEP-409 | Computational Fluid Dynamics | VII | **3:0:0=3** |
| 18 | B23-MEP-411 | Heating, Ventilation and Air-conditioning systems | VII | **3:0:0=3** |
| 19 | B23-MEP-402 | Quality and Reliability Engineering | VIII | **3:0:0=3** |
| 20 | B23-MEP-404 | Composite Materials | VIII | **3:0:0=3** |
| 21 | B23-MEP-406 | Lubricants and Lubrication | VIII | **3:0:0=3** |
| 22 | B23-MEP-408 | Tool Design | VIII | **3:0:0=3** |
| 23 | B23-MEP-410 | Total Quality Management | VIII | **3:0:0=3** |
| 24 | B23-MEP-412 | Concurrent Engineering | VIII | **3:0:0=3** |
| 25 | B23-MEP-414 | Foundry Engineering | VIII | **3:0:0=3** |
| 26 | B23-MEP-416 | Ergonomics | VIII | **3:0:0=3** |

## OPEN ELECTIVES

| Sr. No. | Subject | Semester | Credits |
|---|---|---|---|
| 1 | **OPEN ELECTIVE-I** | VII | **3:0:0=3** |
| 2 | **OPEN ELECTIVE-II** | VIII | **3:0:0=3** |
| | | **Total** | **6** |

## LIST OF OPEN ELECTIVE COURSES [MEO]

| S. No | CodeNo. | Subject | Semester | Credits |
|---|---|---|---|---|
| 1 | B23-MEO-401 | Internet of Things | VII | **3:0:0=3** |
| 2 | B23-MEO-403 | Basics of Electric Vehicle | VII | **3:0:0=3** |
| 3 | B23-MEO-405 | Management Information System | VII | **3:0:0=3** |
| 4 | B23-MEO-407 | Waste to Energy | VII | **3:0:0=3** |
| 5 | B23-MEO-409 | Consumer Electronics | VII | **3:0:0=3** |
| 6 | B23-MEO-411 | Bioinformatics | VII | **3:0:0=3** |
| 7 | B23-MEO-402 | Intellectual Property Rights (IPR) and Regulatory Framework | VIII | **3:0:0=3** |
| 8 | B23-MEO-404 | Digital Marketing | VIII | **3:0:0=3** |
| 9 | B23-MEO-406 | Supply Chain Management | VIII | **3:0:0=3** |
| 10 | B23-MEO-408 | Biomechanics | VIII | **3:0:0=3** |
| 11 | B23-MEO-410 | Artificial Intelligence | VIII | **3:0:0=3** |
| 12 | B23-MEO-412 | Energy Management | VIII | **3:0:0=3** |
| 13 | B23-MEO-414 | Block Chain Technology | VIII | **3:0:0=3** |
| 14 | B23-MEO-416 | Gender Sensitivity | VIII | **3:0:0=3** |

## VALUE ADDED AND MANDATORY COURSES [VAC/MAC]

| S. No. | Course No./ Code | Subject | Semester | Hrs /Week L:T:P | Credits |
|---|---|---|---|---|---|
| 1 | B23-VAC-101 | Personality Development and Soft Skills | I | 2:0:0 | 1 |
| 2 | B23-VAC-102 | IDEA Workshop Theory | II | 2:0:0 | 1 |
| 3 | B23-VAC-104 | IDEA Workshop Lab | II | 0:0:3 | 1 |
| 4 | B23-VAC- 302/304/ 306/308/310 | Hindi Language Skills/ Sanskrit Language Skills/ German Language Skills/ Japanese Language Skills/ French Language Skills | VI | 2:0:0 | 1 |
| 5 | B23-VAC-401/403 /405/407/409/411 | NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/Society activities | VII | 0:0:2 | 1 |
| 6 | B23-MAC-201 | Environmental Studies | III | 3:0:0 | 1 |
| 7 | B23-MAC-202 | Essence of Indian Traditional Knowledge | IV | 3:0:0 | 1 |
| 8 | B23-MAC-301 | Constitution of India | V | 3:0:0 | 1 |
| **Total** | | | | | **8** |

# SEMESTER WISE STRUCTURE

# Bachelor of Technology (Mechanical Engineering), KUK
## Credit-Based (2023-24 Onwards)
### SCHEME OF STUDIES/EXAMINATIONS (Semester - I)

| S. No. | Course No./ Code | Subject | L:T:P | Hours /Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | B23-HSC-101 | English for Technical Writing | 2:0:0 | 2 | 2 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ESC-101 | Programming for Problem Solving | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-BSC-104 | Engineering Chemistry | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-BSC-107 | Mathematics-I | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-106 | Biology | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-HSC-103 | English Language Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-105 | Programming for Problem Solving Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-107 | Manufacturing Processes Workshop | 0:0:3 | 3 | 1.5 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-BSC-114 | Engineering Chemistry Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 10 | B23-VAC-101 | Personality Development and Soft Skills | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| **Total** | | | | **26** | **20.5** | **350** | **410** | **240** | **1000** | |

**Note:**

- **NCC/NSS/Sports/Yoga/Technical or cultural club/society activities will be joined by students in first year and will be evaluated in 7th semester by the Institute based upon continuous evaluation model as per the guidelines.**

# Bachelor of Technology (Mechanical Engineering), KUK
## Credit-Based (2023-24 Onwards)
### SCHEME OF STUDIES/EXAMINATIONS (Semester - II)

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | B23-HSM-101 | Universal Human Values-II: Understanding Harmony and Ethical Human Conduct | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-BSC-102 | Introduction to Electromagnetic Theory | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ESC-102 | Engineering Graphics and Design | 1:0:0 | 1 | 1 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-ESC-103 | Basic Electrical and Electronics Engineering | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-108 | Mathematics-II | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-BSC-112 | Electromagnetic Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-106 | Engineering Graphics and Design Lab | 0:0:4 | 4 | 2 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-108 | Basic Electrical and Electronics Engineering Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-HSC-102 | Design Thinking | 0:0:3 | 2 | 1.5 | -- | 100 | -- | 100 | 3 |
| 10 | B23-VAC-102 | IDEA Workshop | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| 11 | B23-VAC-104 | IDEA Workshop Lab | 0:0:3 | 3 | 1 | -- | 100 | -- | 100 | 3 |
| | **Total** | | | **32** | **23.5** | **350** | **570** | **180** | **1100** | |

**Bachelor of Technology (Mechanical Engineering),**
**KUK Credit-Based (2023-24 Onwards)**
**SCHEME OF STUDIES/EXAMINATIONS (Semester-III)**

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | B23-BSC-201 | Oscillations, Waves and Optics | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-BSC-203 | Mathematics-III | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-MEC-201 | Theory of Machines | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-MEC-203 | Mechanics of Solids-I | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-ESC -201 | Engineering Thermodynamics | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-ESC -203 | Measurement and Control | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 7 | B23-MEC-205 | Theory of Machines Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-MEC-207 | Mechanics of Solids Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-MAC-201 | Environmental Studies | 3:0:0 | 3 | 1 | -- | 100 | -- | 100 | 3 |
| | | **Total** | | **30** | **26** | **420** | **360** | **120** | **900** | |

# Bachelor of Technology (Mechanical Engineering), KUK
## Credit-Based (2023-24 Onwards)
## SCHEME OF STUDIES/EXAMINATIONS (Semester-IV)

| S. No | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | B23-ESC -202 | Materials Engineering | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-MEC-202 | Fluid Mechanics and Machines | 4:1:0 | 5 | 5 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-MEC-204 | Mechanical Vibrations and Tribology | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-MEC-206 | Mechanics of Solids-II | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-MEC-208 | Manufacturing Technology | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-HSM-202 | Innovation, Start-up and Entrepreneurship | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 7 | B23-ESC-204 | Materials Engineering Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-MEC-210 | Fluid Mechanics and Machines Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-MEC-212 | Mechanical Vibrations and Tribology Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 10 | B23-MAC-202 | Essence of Indian Traditional Knowledge | 3:0:0 | 3 | 1 | -- | 100 | -- | 100 | 3 |
| | | **Total** | | **31** | **26** | **420** | **400** | **180** | **1000** | |

**Note:**

- **All students have to undertake the industrial training for 4 to 6 weeks after 4th semester which will be evaluated in 5th semester.**

# Bachelor of Technology (Mechanical Engineering), KUK
## Credit-Based (2023-24 Onwards)
### SCHEME OF STUDIES/EXAMINATIONS (Semester - V)

| S. No | Course No./ Code | Subject | L:T:P | Hours /Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | B23-MEC-301 | Heat Transfer | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-MEC-303 | Production Technology | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-MEC-305 | Mechatronics | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-MEC-307 | Design of Machine Elements | 2:4:0 | 6 | 6 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-HSM-301 | Organizational Behaviour | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-MEC-309 | Heat Transfer Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-MEC-311 | Production Technology Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-MEC-313 | Mechatronics Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | *B23-MEC-315 | *Industrial Training-I | 2:0:0 | 2 | -- | -- | 100 | -- | 100* | -- |
| 10 | B23-MAC-317 | Constitution of India | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| **Total** | | | | **29** | **23** | **350** | **370** | **180** | **900** | |

**Note:**

- ***B23-MEC-315 is a mandatory credit-less course in which the students will be evaluated for the industrial training undergone after 4th semester and students will be required to get passing marks in Internal Assessment to qualify.**

# Bachelor of Technology (Mechanical Engineering), KUK
## Credit-Based (2023-24 Onwards)
### SCHEME OF STUDIES/EXAMINATIONS (Semester - VI)

| S. No | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | B23-MEC-302 | Production and Operation Management | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-MEC-304 | Computer Aided Design and Manufacturing | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-MEC-306 | Refrigeration and Air-conditioning | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-MEC-308 | Internal Combustion Engines | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 5 | | *Program Elective-I | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | | *Program Elective-II | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 7 | B23-MEC-310 | Project-I | 0:0:4 | 4 | 2 | -- | 0 | 100 | 100 | 3 |
| 8 | B23-MEC-312 | Computer Aided Design and Manufacturing Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-MEC-314 | Refrigeration and Air-conditioning Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 10 | B23-VAC-302/304/306/308/310 | Hindi Language Skills/ Sanskrit Language Skills/ German Language Skills/ Japanese Language Skills/ French Language Skills | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| | | **Total** | | **29** | **24** | **420** | **360** | **220** | **1000** | |

| *Program Elective-I | | | *Program Elective-II | |
|---|---|---|---|---|
| **Course No.** | **Course Name** | | **Course No.** | **Course Name** |
| B23-MEP-302 | Renewable Energy Resources | | B23-MEP-314 | Optimization Techniques |
| B23-MEP-304 | Smart Materials | | B23-MEP-316 | Design of Transmission Systems |
| B23-MEP-306 | Industry 4.0 | | B23-MEP-318 | Non-Conventional Machining |
| B23-MEP-308 | Welding Technology | | B23-MEP-320 | Power Plant Engineering |
| B23-MEP-310 | Theory of Elasticity and Plasticity | | B23-MEP-322 | Acoustics and Noise Control |
| B23-MEP-312 | Industrial Robotics | | B23-MEP-324 | Product Design and Development |

**Note: * The course of Program Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**

- **All students have to undertake the industrial training for 4 to 6 weeks after 6th semester which will be evaluated in 7th semester.**

# Bachelor of Technology (Mechanical Engineering), KUK
## Credit-Based (2023-24 Onwards)
### SCHEME OF STUDIES/EXAMINATIONS (Semester - VII)

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | | *Program Elective-III | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | | **Open Elective-I | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-MEC-401 | Automobile Engineering | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-MEC-403 | Python for Mechanical Engineering | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-MEC-405 | Project-II | 0:0:8 | 8 | 4 | -- | 100 | 100 | 200 | 3 |
| 6 | B23-MEC-407 | Python for Mechanical Engineering Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | #B23-MEC-409 | Industrial Training-II | 2:0:0 | 2 | -- | -- | 100 | -- | 100# | |
| 8 | #B23-MEC-411 | Seminar | 0:0:2 | 2 | -- | | 100 | | 100# | |
| 9 | B23-VAC-401/403/405/407/409/411 | NCC/NSS/Sports/ Yoga/ Technical or Cultural Club/Society activities | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| | | Total | | 28 | 18 | 280 | 260 | 160 | 700 | |

| *Program Elective-III | | | | | **Open Elective-I | |
|---|---|---|---|---|---|---|
| Course No. | Course Name | | | | Course No. | Course Name |
| B23-MEP-401 | Manufacturing Automation | | | | B23-MEO-401 | Internet of Things |
| B23-MEP-403 | Finite Element Analysis | | | | B23-MEO-403 | Basics of Electric Vehicle |
| B23-MEP-405 | Air-conditioning System Design | | | | B23-MEO-405 | Management Information System |
| B23-MEP-407 | Non-destructive Testing | | | | B23-MEO-407 | Waste to Energy |
| B23-MEP-409 | Computational Fluid Dynamics | | | | B23-MEO-409 | Consumer Electronics |
| B23-MEP-411 | Heating, Ventilation and Air-conditioning systems | | | | B23-MEO-411 | Bioinformatics |

**Note: The course of both Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**

- **#B23-MEC-409 and B23-MEC-411 are mandatory credit-less courses in which the students will be evaluated for the industrial training undergone after 6th semester and Seminar on the thrust of the discipline. Students will be required to get passing marks to qualify.**
- ***B23-VAC-401/403/405/407/409/411 are single credit value added courses in which NCC/NSS/Sports/Yoga/Technical or Cultural Club/Society activities will be joined by students in first year and will be evaluated in 7th semester by the institute based upon continuous evaluation model as per guidelines.**

# Bachelor of Technology (Mechanical Engineering), KUK
## Credit-Based (2023-24 Onwards)
### SCHEME OF STUDIES/EXAMINATIONS (Semester - VIII)

| S. No | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | | *Program Elective-IV | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | | **Open Elective-II | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3. | B23-MEC-402/404 /406/408 | Project-IV/ Industrial Training/ Entrepreneurship/ Start-up | 0:0:10 | 10 | 5 | | 100 | 100 | 200 | 3 |
| | | | **Total** | **16** | **11** | **140** | **160** | **100** | **400** | |

| *Program Elective-IV | | **Open Elective-II | |
|---|---|---|---|
| **Course No.** | **Course Name** | **Course No.** | **Course Name** |
| B23-MEP-402 | Quality and Reliability Engineering | B23-MEO-402 | Intellectual Property Rights (IPR) and Regulatory Framework |
| B23-MEP-404 | Composite Materials | B23-MEO-404 | Digital Marketing |
| B23-MEP-406 | Lubricants and Lubrication | B23-MEO-406 | Supply Chain Management |
| B23-MEP-408 | Tool Design | B23-MEO-408 | Biomechanics |
| B23-MEP-410 | Total Quality Management | B23-MEO-410 | Artificial Intelligence |
| B23-MEP-412 | Concurrent Engineering | B23-MEO-412 | Energy Management |
| B23-MEP-414 | Foundry Engineering | B23-MEO-414 | Block Chain Technology |
| B23-MEP-414 | Ergonomics | B23-MEO-416 | Gender Sensitivity |

**Note:**

- **The Program Elective and Open Elective will be offered at 1/3rd strength or 20 students (whichever is smaller) of the section.**
- **In case of semester-long project work/training done in industry, the Program Elective- IV and Open Elective-II may be offered in online mode through MOOC courses from SWAYAM/NPTEL.**

## Mechanical Engineering

Students of Mechanical Engineering are offered to earn **ADDITIONAL 18-20 CREDITS** through MOOCs/SWAYAM courses as per the 'Guidelines to implement the SWAYAM/MOOCs/ other authorized online courses (OAOC) of Kurukshetra University, Kurukshetra' in any of the emerging areas mentioned below for the award of the degree of:

1. **B.Tech. (Hons.) Mechanical Engineering with Specialization in 3D Printing**
2. **B.Tech. (Hons.) Mechanical Engineering with Specialization in Electric Vehicles**
3. **B.Tech. (Hons.) Mechanical Engineering with Specialization in Energy Engineering**
4. **B.Tech. (Hons.) Mechanical Engineering with Specialization in Robotics**
5. **B.Tech. (Hons.) Mechanical Engineering with Specialization in Mechatronics**
6. **B.Tech. Mechanical Engineering with Minor Degree in Artificial Intelligence and Machine Learning**
7. **B.Tech. Mechanical Engineering with Minor Degree in Blockchain**
8. **B.Tech. Mechanical Engineering with Minor Degree in Data Science**
9. **B.Tech. Mechanical Engineering with Minor Degree in Internet of Things (IoT)**
10. **B.Tech. Mechanical Engineering with Minor Degree in Cyber Security**
11. **B.Tech. Mechanical Engineering with Minor Degree in Computer Science and Biology**
12. **B.Tech. Mechanical Engineering with Minor Degree in Drug Engineering**
13. **B.Tech. Mechanical Engineering with Minor Degree in Genome Engineering and Technology**

# B.Tech. Biotechnology
# KURUKSHETRA UNIVERSITY KURUKSHETRA

## Semester-I

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | B23-HSC-101 | English for Technical Writing | 2:0:0 | 2 | 2 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ESC-101 | Programming for Problem Solving | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-BSC-105 | Chemistry | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-BSC-109 | Applied Mathematics-I | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-106 | Biology | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-HSC-103 | English Language Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-105 | Programming for Problem Solving Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-107 | Manufacturing Processes Workshop | 0:0:3 | 3 | 1.5 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-BSC-114 | Engineering Chemistry Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 10 | B23-VAC-101 | Personality Development and Soft Skills | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| **Total** | | | | **27** | **21.5** | **350** | **410** | **240** | **1000** | |

**Note: NCC/NSS/Sports/Yoga/Technical or cultural club/society activities will be joined by students in first year and will be evaluated in the 7th semester by the Institute based upon continuous evaluation model as per the guidelines.**

# B.Tech. Biotechnology
# KURUKSHETRA UNIVERSITY KURUKSHETRA

## Semester - II

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of Exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | B23-HSM-101 | Universal Human Values-II : Understanding Harmony and Ethical Human conduct | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ESC-102 | Engineering Graphics and Design | 1:0:0 | 1 | 1 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ESC-103 | Basic Electrical and Electronics Engineering | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-BSC-103 | Applied Physics | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-110 | Applied Mathematics-II | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-ESC-106 | Engineering Graphics & Design Lab | 0:0:4 | 4 | 2 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-108 | Basic Electrical and Electronics Engineering lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-BSC-113 | Applied Physics Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-HSC-102 | Design Thinking | 0:0:3 | 3 | 1.5 | -- | 100 | -- | 100 | 3 |
| 10 | B23-VAC-106 | IDEA Workshop Theory | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| 11 | B23-VAC-108 | IDEA Workshop Lab | 0:0:4 | 4 | 1 | -- | 100 | -- | 100 | 3 |
| **Total** | | | | **33** | **23.5** | **350** | **570** | **180** | **1100** | |

**Biotechnology**

**Students of Biotechnology are offered to earn ADDITIONAL 18-20 CREDITS through MOOCs/SWAYAM courses as per the 'Guidelines to implement the SWAYAM/MOOCs/ other authorized online courses (OAOC) of Kurukshetra University, Kurukshetra' in any of the emerging areas mentioned below for the award of the degree of:**

1. **B.Tech. (Hons.) Biotechnology with Specialization in Computer Science and Biology**
2. **B.Tech. (Hons.) Biotechnology with Specialization in Drug Engineering**
3. **B.Tech. (Hons.) Biotechnology with Specialization in Genome Engineering and Technology**
4. **B.Tech. Biotechnology with Minor Degree in Artificial Intelligence and Machine Learning**
5. **B.Tech. Biotechnology with Minor Degree in Blockchain**
6. **B.Tech. Biotechnology with Minor Degree in Data Science**
7. **B.Tech. Biotechnology with Minor Degree in Internet of Things (IoT)**
8. **B.Tech. Biotechnology with Minor Degree in Cyber Security**
9. **B.Tech. Biotechnology with Minor Degree in 3D Printing**
10. **B.Tech. Biotechnology with Minor Degree in Electric Vehicles**
11. **B.Tech. Biotechnology with Minor Degree in Energy Engineering**
12. **B.Tech. Biotechnology with Minor Degree in Mechatronics**
13. **B.Tech. Biotechnology with Minor Degree in Robotics**

# KURUKSHETRA UNIVERSITY, KURUKSHETRA

*(ESTABLISHED BY THE STATE LEGISLATURE ACT XII OF 1956)*
*('A+' GRADE NAAC ACCREDITED)*

# Scheme & Syllabus of B.Tech. Degree in Electrical and Computer Engineering (ECO)

**(w.e.f. session 2023-24 onwards)**

## B.Tech. Electrical and Computer Engineering (ECO)
## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER I

| S.No. | Course No./Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester Exam | Internal assessment | Practical exam | Total | |
| 1 | B23-BSC-101 | Semiconductor Physics | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-HSM-101 | Universal Human Values-II: Understanding Harmony and Ethical Human conduct | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ESC-102 | Engineering Graphics and Design | 1:0:0 | 1 | 1 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-ESC-104 | Basic Electrical Engineering | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-107 | Mathematics-I | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-BSC-111 | Semiconductor Physics Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-106 | Engineering Graphics and Design Lab | 0:0:4 | 4 | 2 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-109 | Basic Electrical Engineering Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-VAC-110 | IDEA Workshop | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| 10 | B23-VAC-112 | IDEA Project Workshop | 0:0:2 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| 11 | B23-HSC-102 | Design Thinking | 0:0:3 | 3 | 1.5 | - | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **31** | **23.5** | **350** | **570** | **180** | **1100** | **-** |

**Note:**

- **NCC/NSS/Sports/Yoga/Technical or cultural club/society activities will be joined by students in first year and will be evaluated in 7th semester by the institute based upon continuous evaluation model as per guidelines.**

## B.Tech. Electrical and Computer Engineering (ECO)
## KURUKSHETRA UNIVERSITY, KURUKSHETRA

### SEMESTER II

| S.No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule(Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End Semester | Internal assessment | Practical Exam | Total | |
| 1 | B23-HSC-101 | English for Technical Writing | 2:0:0 | 2 | 2 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ESC-101 | Programming for Problem Solving | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-BSC-104 | Engineering Chemistry | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-BSC-108 | Mathematics-II | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-106 | Biology | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-HSC-103 | English Language Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-105 | Programming for Problem Solving Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-107 | Manufacturing Processes Workshop | 0:0:3 | 3 | 1.5 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-ESC-114 | Engineering Chemistry Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 10 | B23-VAC-101 | Personality Development and Soft Skills | 2:0:0 | 2 | 1 | -- | 100 | -- | 100 | 3 |
| **TOTAL** | | | | **26** | **20.5** | **350** | **410** | **240** | **1000** | |

# B.Tech. Electrical and Computer Engineering (ECO)
# KURUKSHETRA UNIVERSITY, KURUKSHETRA

Students of Electrical and Computer Engineering are offered to earn **ADDITIONAL 18-20 CREDITS** through MOOCs/SWAYAM courses as per the 'Guidelines to implement the SWAYAM/MOOCs/ other authorized online courses (OAOC) of Kurukshetra University, Kurukshetra' in any of the emerging areas mentioned below for the award of the degree of:

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2. **B.Tech. (Hons.) Electrical and Computer Engineering with Specialization in Energy Engineering**
3. **B.Tech. (Hons.) Electrical and Computer Engineering with Specialization in Artificial Intelligence and Machine Learning**
4. **B.Tech. (Hons.) Electrical and Computer Engineering with Specialization in Internet of Things (IoT)**
5. **B.Tech. Electrical and Computer Engineering with Minor Degree in Mechatronics**
6. **B.Tech. Electrical and Computer Engineering with Minor Degree in VLSI Design**
7. **B.Tech. Electrical and Computer Engineering with Minor Degree in Genome Engineering and Technology**
8. **B.Tech. Electrical and Computer Engineering with Minor Degree in Cyber Security**

| B23-HSC-101 | English for Technical Writing | | | | | | |
|---|---|---|---|---|---|---|---|
| L | T | P | Credit | End Semester Exam | Internal Assessment | Total | Time |
| 2 | - | - | 2 | 70 | 30 | 100 | 3h |

| | |
|---|---|
| **Purpose** | **To introduce the basics of communication and technical writing skill for the students of Engineering** |
| **CO 1** | **Building up the vocabulary** |
| **CO 2** | **Students will acquire basic proficiency in English including writing skills** |
| **CO3** | Students will be able to select the most appropriate mode of communication for a given situation and will be able to speak assertively and effectively. |
| **CO4** | Students will be able to write effective reports, proposals and papers and present themselves professionally through effective resumes and interviews. |

**UNIT- 1**

**Fundamentals of communication skills**

Meaning and types of communication skills, Listening,Speaking, Reading and Writing, Importance of technical communication, Barriers in communication, Tools of effective communication.

**UNIT- 2**

**Vocabulary Building**

Word formation &Synonyms and Antonyms, One-word substitution, Abbreviations of scientific and technical words, phrasal verbs and Idioms.

**UNIT- 3**

**Fundamentals of Writing Skills**

Job application, CV writing, Business letter, Report writing and E-mail writing, redundancies, precise writing skill, Basics of grammar: uses of tenses, subject verb agreement, narration, active voice.

**UNIT- 4**

**Fundamentals of Speaking skills**

Speaking skills, Oral presentation, Body language, Group discussion, Technical Telephonic conversation. Introduction to phonetic sounds, symbol and articulation

**Suggested Books:**


- Practical English Usage. Michael Swan. OUP. 1995.
- Remedial English Grammar. F.T. Wood. Macmillan.2007
- On Writing Well. William Zinsser. Harper Resource Book. 2001
- Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
- Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.
- Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press


**Note: The paper setter will set the paper as per the question paper templates provided.**

| B23-HSC-103 | English Language Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| L | T | P | Credit | Practical Exam | Internal Assessment | Total | Time |
| - | - | 2 | 1 | 60 | 40 | 100 | 3h |

**OBJECTIVES**

1. Listening comprehension
2. Pronunciation, intonation, stress and Rhythm
3. Communication at work place
4. Group Discussion
5. Interview
6. Writing skills: speech writing

| B23-ESC-101 | Programming for Problem Solving | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Exam Time** |
| **3** | **0** | **`-** | **3** | **70** | **30** | **100** | **3 Hour** |

| **Course Outcomes** | |
|---|---|
| **CO 1** | To learn the fundamentals of computers and to understand the various steps in program development. |
| **CO 2** | To learn the syntax and semantics of C programming language. To learn the usage of structured programming approach in solving problems. |
| **CO 3** | To learn the usage of structured programming approach in solving problems. |
| **CO 4** | To analyze the output based on the given input variables. |

**UNIT-I**

Introduction to Programming; Introduction to components of a computer system (Disks, Memory, Processor, Operating System, Compilers etc.), Algorithm Writting, Flowchart, Pseudocode with examples. From algorithms to programs.

**UNIT-II**

C language variables and data types, Syntax and Logical Errors in compilation, object and executable code. Operator (arithematic, relational, logical, bitwise operator) and Precedence, Conditional Branching and Loops.

**UNIT-III**

Arrays, Arrays (1-D, 2-D), Character arrays and Strings, Structures, Defining structures and Array of Structures, Pointers, Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, notion of linked list (no implementation) , Function, Functions (including using built in libraries), Parameter passing in functions, call by value.

**UNIT-IV**

Idea of call by reference, Recursion, Recursion as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, File handling in different mode

**Suggested Books:**


1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill.
3. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.


**Note: Note: An approved question paper template is to be provided to the paper setter.**

| B23-ESC-105 | Programming for Problem Solving Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **Practical** | **Credit** | **Internal Assessment** | **Practical** | **Total** | **Exam Time** |
| **0** | **0** | **2** | **1** | **40** | **60** | **100** | **3 Hrs** |
| **Purpose** | **To understand the various steps in program development, syntax of C programming language and usage of structured programming approach in solving problems.** | | | | | | |
| | **Course Outcomes** | | | | | | |
| **CO1** | **To Familiarize with programming environment** | | | | | | |
| **CO 2** | **To solve Problems involving if-then-else structures** | | | | | | |
| **CO 3** | **To define and declare Simple functions to add, multiply etc** | | | | | | |
| **CO 4** | **To call Recursive functions and implement factorial, Fibonacci series** | | | | | | |

## LIST OF EXPERIMENTS

1. To Familiarize with programming environment
2. Simple computational problems using arithmetic expressions
3. Problems involving if-then-else structures
4. Iterative problems (e.g., sum of series)
5. 1D Array manipulation
6. Matrix problems (Addition and Multiplication)
7. String operations
8. Simple functions to add, multiply etc...
9. Programming for solving Numerical methods problems
10. Recursive functions factorial, Fibonacci series
11. Pointers and structures
12. File operations (to read from file and write into file)

**Note: At least 9 experiments to be performed during the semester.**

| B23-HSC-102 | Design Thinking | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assesment** | **Total** | **Exam Hour** |
| **0** | **0** | **3** | **1.5** | **0** | **100** | **100** | **3 Hr.** |
| **Course Outcomes** | | | | | | | |
| **CO1** | Students will be able to understand the concept of Design Thinking | | | | | | |
| **CO2** | Students will be able to empathize and define the problems | | | | | | |
| **CO3** | Students will be able to ideate and prototype the proposed solution | | | | | | |
| **CO4** | Students will be able to test and present the proposed solution | | | | | | |

# List of Experiments

1. Introduction to Design Thinking

2. **Empathize** on real life problems
   a) Observe
   b) Engage
   c) Watch and Listen

3. **Define** the problem statement
   a) User
   b) Needs
   c) Insights

4. **Ideate** on problem statement
   a) Brainstorming
   b) Constraints
   c) Best solutions

5. **Prototype** the design solution
   a) Start building
   b) Timing of prototype
   c) Build a prototype
   d) Build with user in mind

6. **Test** the design solution
   a) User's hand on
   b) Create experiences
   c) Users to compare

7. Final power point Presentation on the proposed solution

| B23-BSC-104 | Engineering Chemistry | | | | | | |
|---|---|---|---|---|---|---|---|
| L | T | P | Credit | End Semester Exam | Internal Assessment | Total | Time |
| 3 | 0 | 0 | 3 | 70 | 30 | 100 | 3h |
| Purpose | To acquaint the students with the basic phenomenon/concepts of chemistry, the student faces during course of their study in the industry and Engineering field | | | | | | |
| CO1 | An insight into atomic and molecular orbitals and bonding in molecules | | | | | | |
| CO2 | Knowledge of basic concept of spectroscopic techniques for identification of molecules | | | | | | |
| CO3 | To understand basics of thermodynamics and phase equilibria | | | | | | |
| CO4 | To understand nature of corrosion and its preventive measures | | | | | | |

**UNIT -I**

Molecular orbitals of diatomic molecules. Equations for atomic and molecular orbitals. Energy level diagrams of diatomic molecules ($O_2$, $N_2$, CO, NO, CN, HCl and HF). Pi-molecular orbitals of butadiene. Concept of aromaticity. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.

**UNIT -II**

Spectroscopic techniques and applications: Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational spectroscopy and its applications. Nuclear magnetic resonance and magnetic resonance imaging, surface characterization techniques. Diffraction and scattering.

**UNIT -III**

Thermodynamic functions: Internal energy, entropy and free energy. Estimations of entropy and free energies. Free energy and EMF. Criteria for feasibility/spontaneity of a process, Chemical potential, Clausius – Clapeyron equation and its application, Numerical problems.

Phase equilibria: Phase rule and derivation of phase rule equation, terms involved in phase rule (phase, component, degree of freedom), one component system (Water system), two component system (Lead-silver system), application of phase equilibria.

**UNIT - IV**

Corrosion and its prevention: Introduction, Galvanic cell, types of Galvanic cell (Chemical and concentration cell), Cell potentials, the Nernst equation and its applications, types of corrosion (Dry and wet corrosion), electrochemical theory of corrosion, Bimetallic corrosion, Pitting corrosion, Differential aeration corrosion, water -line corrosion, stree corrosion, factors affecting corrosion rate, preventive measures of corrosion (design of material, anodic and cathodic protection and protective covering)

**Text/Reference Books:**

1. AICTE's Prescribed Textbook: Chemistry – I with Lab Manual, Khanna Book Publishing.
2. Engineering Chemistry, by Manisha Agrawal.
3. University chemistry, by B. H. Mahan.
4. Chemistry: Principles and Applications, by M. J. Sienko and R. A. Plane.
5. Fundamentals of Molecular Spectroscopy, by C. N. Banwell.
6. Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan.
AICTE Model Curriculum for UG Degree Course in Computer Science and Engineering 54

| B23-BSC-114 | Engineering Chemistry Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| L | T | P | Credit | Practical Exam | Internal Assessment | Total | Time |
| 0 | 0 | 2 | 1 | 60 | 40 | 100 | 3h |
| Purpose | To acquaint the students with the knowledge of basic phenomenon/practicals of chemistry | | | | | | |
| CO1 | To make the students familiar with the titrametric methods for analysing strength of given sample | | | | | | |
| CO2 | To give exposure and training to handle different instruments used in various experiments of chemistry required in engineering/technological field | | | | | | |

Choice of 10-12 experiments from the following:

1. Determination of surface tension of a given liquid by drop number method using Stalagmometer.
2. Determination of relative viscosity by Ostwald viscometer.
3. Determination of viscosity of lubricating oil by Redwood Viscometer.
4. To synthesise drug molecule (Aspirin/ Paracetamol)
5. Determination of refractive index of given organic liquid by Abbe's refractometer.
6. Determination of Flash point and fire point of oil by Pensky Martin appratus.
7. Determination of amount of Na and K in given water sample by Flame photometer.
8. Determination of strength of given Hydrochloric acid solution by titrating it with NaOH solution conduct metrically.
9. Determination of strength of given Hydrochloric acid solution by titrating it with NaOH solution using pH meter.
10. Determination of concentration of given sample of $KMnO_4$ using spectrophotometer.
11. Determination of alkalinity of a given water sample.
12. Determination of Calcium and Magnesium hardness by EDTA method.
13. Determination of Chloride content in given water sample.
14. Determination of amount of dissolved oxygen in given water sample by Winkler's method.
15. Determination of total iron content present in a given iron ore solution by using $KMnO_4$ as oxidising agent.
16. Determination of partition co-efficient of Iodine in carbon tetrachloride and water.
17. To check the presence of a given compound in a mixture using thin layer chromatography.

Books:

1. Engineering Chemistry with laboratory experiments by M. S. Kaurav, PHI learning Private ltd.
2. AICTE's Prescribed Textbook: Chemistry – I with Lab Manual, Khanna Book Publishing

| B23-BSC-107 | MATHEMATICS-I | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time** |
| **3** | **1** | **-** | **4** | **70** | **30** | **100** | **3 h** |
| **Purpose** | **The primary objective of this course is to attain conceptual comprehension and preserve the core principles of classical calculus, through a syllabus tailored to equip students with fundamental mathematical tools for the purpose of mathematically modeling engineering problems and deriving solutions.** | | | | | | |
| **Course Outcomes** | | | | | | | |
| CO1 | To introduce the idea of applying differential and integral calculus to notions of improper integrals. Apart from some applications it gives a basic introduction on Beta and Gamma functions. | | | | | | |
| CO 2 | To develop the tool of series for learning advanced Engineering Mathematics | | | | | | |
| CO 3 | To familiarize the student with calculus (derivative) of the functions of several variables that is essential in most branches of engineering. | | | | | | |
| CO 4 | To familiarize the student with calculus (integration) of the functions of several variables. | | | | | | |

**UNIT-I** (8 hrs)

**Single Variable Calculus:** Evaluation of definite and improper integrals: Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions; Indeterminate forms and L'Hospital's rule.

**UNIT-II** **(**10 hrs)

**Sequence and Series**: Convergence of sequence and series, tests for convergence (Comparison test, D'Alembert's Ratio test, Logarithmic test, Cauchy root test, Raabe's test).

**Fourier series**: Introduction, Fourier-Euler Formula, Dirichlet's conditions, Change of intervals, Fourier series for even and odd functions, Half range sine and cosine series.

**UNIT-III** (10 hrs)

**Multivariable Calculus (differentiation):** Taylor's series (for one and more variables), series for exponential, trigonometric and logarithm functions.

Partial derivatives, Total differential, Chain rule for differentiation, Homogeneous functions, Euler's theorem, Jacobian, Maxima, minima and saddle points; Method of Lagrange multipliers.

**UNIT-IV** (12 hrs)

**Multivariable Calculus (Integration):** Multiple Integration: Double integrals (Cartesian), change of order of integration in double integrals, Change of variables (Cartesian to polar).

Applications: areas and volumes; Triple integrals (Cartesian), orthogonal curvilinear coordinates, Simple applications involving cubes, sphere and rectangular parallelepipeds.

**Suggested Books:**

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. Erwin Kreyszig and SanjeevAhuja, Applied Mathematics- I, Wiley India Publication, Reprint 2015.
3. Reena Garg, Engineering Mathematics, Khanna Book Publishing Company, 2022.
4. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson.
5. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
6. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
7. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
8. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications.
9. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 2023.

**Note: The paper setter will set the paper as per the question paper templates provided.**

| B23-BSC-108 | MATHEMATICS-II | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time** |
| **3** | **1** | **-** | **4** | **70** | **30** | **100** | **3 h** |
| **Purpose** | **This course aims to provide prospective engineers with a comprehensive understanding of matrix operations, ordinary differential equations, and complex variables, enabling them to proficiently apply advanced mathematical concepts and tools to address complex problems.** | | | | | | |
| **Course Outcomes** | | | | | | | |
| CO1 | To develop the essential tool of matrices and linear algebra in a comprehensive manner. | | | | | | |
| CO 2 | To introduce effective mathematical tools for the solutions of differential equations that model physical processes. | | | | | | |
| CO 3 | To acquaint the student with vector calculus to solve advance engineering problems. | | | | | | |
| CO 4 | Acquaint the students with the formation and solutions for multivariable differential equations and basics of Curve fitting for fitting of data originated from real world problems. | | | | | | |

**UNIT-I** (8 hrs)

**Matrices:** Rank of a matrix, elementary transformations, elementary matrices, Gauss Jordon method to find inverse using elementary transformations, normal form of a matrix, linear dependence and independence of vectors, consistency of linear system of equations, linear and orthogonal transformations, Eigen values and Eigenvectors, properties of eigenvalues, Cayley – Hamilton theorem and its applications.

**UNIT-II** **(**10 hrs)

**First order ordinary differential equations:** Exact, linear and Bernoulli's equations, Euler's equations, Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x.

**Ordinary differential equations of higher orders:**

Second order linear differential equations with constant coefficients, method of variation of parameters, Cauchy and Legendre's linear differential equations.

**UNIT-III** (11hrs)

**Vector Calculus-Differentiation:** Introduction, Scalar and Vector point functions, Gradient, divergence & Curl and their properties, Directional derivative.

**Vector Calculus-Integration:** Line integrals, surface integrals, volume integrals, Theorems of Green, Gauss and Stokes (without proof).

**UNIT-IV** (11 hrs)

**Partial Differential Equations**: Formation of Partial Differential Equations, Solution to homogenous linear partial differential equations (with constant coefficients) by complimentary function and particular integral method.**Curve fitting by the method of least squares:** Introduction, Fitting of a straight line, fitting of second degree curve, fitting of a polynomial of degree m, fitting of a geometric or power curve of the form $y = ax^b$, fitting of an exponential curve of the form $y = ab^x$.

**Suggested Books:**

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson,Reprint, 2002.
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3. Erwin kreyszig and SanjeevAhuja, Applied Mathematics- II, Wiley India Publication, 2015.
4. W. E. Boyce and R. C. DiPrima, Elementary Differential Equations and Boundary ValueProblems, 9th Edn., Wiley India, 2009.
5. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
6. S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.
7. E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice HallIndia, 1995.
8. E. L. Ince, Ordinary Differential Equations, Dover Publications, 1958.
9. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Ed., Mc-Graw Hill,2004.
10. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
11. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
12 S. J. Farlow, Partial Differential Equations for Scientists and Engineers, Dover Publications, 1993. AICTEModel Curriculum in Mathematics.
13. R. Haberman, Elementary Applied Partial Differential equations with Fourier Series and Boundary Value Problem, 4th Ed., Prentice Hall, 1998.
14. Ian Sneddon, Elements of Partial Differential Equations, McGraw Hill, 1964.
15. Manish Goyal and N.P. Bali, Transforms and Partial Differential Equations, University Science Press, Second Edition, 2010.

**Note: The paper setter will set the paper as per the question paper templates provided.**

| B23-BSC-106 | BIOLOGY | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical Exam** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time Hrs.** |
| **3** | **0** | **-** | **3** | **70** | **30** | **100** | **3** |
| **Purpose** | **To familiarize the students with the basics of Biology and Biotechnology** | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | **Introduction to Living world, Cell & Organisms.** | | | | | | |
| **CO2** | **Introduction to Biomolecules and Biocatalyst** | | | | | | |
| **CO3** | **Introduction of basic Concept of Genetics.** | | | | | | |
| **CO4** | **Introduction of basic Concept of Genetic Engineering, & Role of Biology in Different Fields** | | | | | | |

## Unit – I

**Introduction to living world:** Concept and definition of Biology; Importance of biology in major discoveries of life Characteristic features of living organisms; Cell ultra-structure and functions of cell organelles like nucleus and endoplasmic reticulum. Difference between prokaryotic and eukaryotic cell. Difference between animal and plant cell.

**Classification of Organisms**: Classification of the organisms on the basis of Energy, Carbon Utilization, Nitrogen Excretion and Habitat.

## Unit-II

**Introduction to Biomolecules:** Definition, general classification and important functions of carbohydrates, lipids, proteins, nucleic acids & Enzymes.

**Enzymes as Biocatalysts:** General characteristics, nomenclature and classification of Enzymes. Effect of temperature, pH and substrate concentrations on the activity of enzymes. Elementary concept of coenzymes. Mechanism of enzyme action.

## Unit-III

**Genetics:-**Mendel's laws of inheritance, Cell Division- Mitosis & meiosis, Genetic Disorders: Single gene & Multiple genes disorders in human.

**Human Traits**: Genetics of blood groups, Diabetes Type I & II.

## Unit-IV

**Concepts of Genetic Engineering:** Definition; Tools used in recombinant DNA Technology: Enzymes, Vectors & Passenger DNA.
**Role of Biology:** Role of Biology in Agriculture, Medicine, Forensic science & Bioinformatics.

**Text Book:**

1. Introduction to Biotechnology, By Deswal & Deswal, Dhanpat Rai Publications N.A
2. Campbell, J. B. Reece, L. Urry, M. L. Cain and S. A. Wasserman, "Biology: A global approach", Pearson Education Ltd, 2014.
3. E. E. Conn, P. K. Stumpf, G. Bruening and R. H. Doi, "Outlines of Biochemistry", John Wiley and Sons, 2009.
D. L. Nelson and M. M. Cox, "Principles of Biochemistry", W.H. Freeman and Company, 2012.
4.G. S. Stent and R. Calendar, "Molecular Genetics", Freeman and company, 1978.

**Note: The paper setter will set the paper as per the question paper templates provided**
**Suggested Books:**
1. Molecular Biology of cell, 4th ed. Alberts, Bruce et al. Garland Science Publishing, New York.
2. Microbiology. Pelczar Jr., M.J.; Chan, E.C.S. and Krieg, N.R. Tata McGraw Hill, New Delhi.
3. Lehninger: Principles of Biochemistry, 3rd edition, by David L. Nelson and M.M. Cox. Maxmillan/ Worth publishers.
4. Genetics by Snusted& Simmons.
5. Molecular Biotechnology: Principles Application of Recombinant DNA. Glick, B. R. and Pasternak, J. J. ASM press
Washington DC.
6. Kuby's Immunology, Goldsby, R A,.Kindt, T.J, Osborne, B.A.(2003) W. H. Freeman and company, New York.
7. Recombinant DNA 2nd Edition. Watson, James D. and Gilman, M. (2001) W.H Freeman and Company, NewYork.

| B23-ESC-107 | Manufacturing Processes Workshop (B.Tech. Semester-I/II) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Practical** | **Total** | **Time (Hrs.)** |
| **0** | **0** | **3** | **1.5** | **0** | **40** | **60** | **100** | **3** |
| **Purpose** | To make student gain a hands on work experience in a typical manufacturing industry environment. | | | | | | | |
| **Course Outcomes** | | | | | | | | |
| **CO 1** | **Students will be explain** different manufacturing operations used in industries and work on CNC machine and 3D printer. | | | | | | | |
| **CO 2** | **Students will be able to know operations and working** in Fitting shop and Electrical and Electronics shops. | | | | | | | |
| **CO 3** | **Students will be able to perform** on Carpentry operations. | | | | | | | |
| **CO 4** | **Students will be able to explain m**etal casting and welding jobs operations. | | | | | | | |

**List of Experiments**

**A) Manufacturing Operations**

1. To study various manufacturing methods.
2. To study different machine tools used in manufacturing industries.
3. To prepare a job on a lathe involving facing, outside turning taper turning, step turning, radius making and parting-off. **(Practice)**
4. To prepare a job involving side and face milling on a milling machines. **(Practice)**

**B) CNC machining, Additive manufacturing**

1. To study basics of CNC Machine tool.
2. To study the basics of additive manufacturing.
3. To write and simulate CNC Part program for a CNC Milling machine.**(Practice)**
4. To write and simulate CNC Part program for a CNC Turning machine.**(Practice)**
5. Modelling and converting CAD models into STL files, and Fabrication of one simple component using 3D printer from CAD models using polymers.**(Practice)**

**C) Fitting operations**

1. To Study various Fitting operations and tools used in Fitting shop.
2. To make a V-groove and V-notch in MS flat.**(Practice)**

**D) Electrical and Electronics operations**

1. To study basics of house wiring
2. To Make an electrical connection to demonstrate domestic voltage and current sharing. **(Practice)**
3. To perform Soldering of a resistor on a PCB. **(Practice)**

**E) Carpentry operations**

1. To study steps various tools used in Carpentry shop.
2. To make wooden halving joint (or Cross-Joint) of soft wood.**(Practice)**

**F) Metal Casting operations**

1. To study various components of Sand Mould and operations involved in the casting process used in Foundry shop.
2. To test different properties of Sand mould.**(Practice)**

**G) Welding operations**

1. To study various processes and tools used in welding shop.
2. To make a Butt joint using the given two M.S pieces by arc welding.**(Practice)**
3. To make a Lap joint using the given two M.S pieces by arc welding.**(Practice)**

**Note: At least one experiment may be performed from each of the categories from A to G (Preferably from Practice type). In total at least 8 experiments need to be performed by the students.**

**Text Books**


1. Workshop / Manufacturing Practices (with Lab Manual) by Veerana D.K(AICTE Prescribed Text book as per model curriculum)
2. Veerana D.KKalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology",7th edition, Pearson Education India Edition.
3. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., " Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.


**Reference Books**


1. Gowri P. Hariharan and A. Suresh Babu," Manufacturing Technology – I" Pearson Education, 2008.
2. Roy A. Lindberg, " Processes and Materials of Manufacture" , 4th edition, Prentice Hall India, 1998
3. Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGraw-Hill House, 2017.

| B23-HSM-101 | Universal Human Values II: Understanding Harmony and Ethical Human Conduct | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time** |
| **3** | **0** | **0** | **3** | **70** | **30** | **100** | **3h** |
| **Purpose** | Purpose and motivation for the course, recapitulation from Universal Human Values-I | | | | | | |
| **Course Outcomes (CO)** | | | | | | | |
| **CO 1** | To enable the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings | | | | | | |
| **CO 2** | To facilitate the development of a Holistic perspective among students towards life and Profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence | | | | | | |
| **CO 3** | To develop understanding Harmony in the Family and Society and the Vision for the Universal Human Order | | | | | | |
| **CO 4** | To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature. | | | | | | |

## Unit 1

**Course Introduction - Need, Basic Guidelines, Content and Process for Value Education**

Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education), Understanding Value Education, Self-exploration as the Process for Value Education ; Continuous Happiness and Prosperity- A look at Basic Human Aspirations ; current scenario , Method to Fulfill the Basic Human Aspirations; concept of natural acceptance and ways to explore it.

## Unit 2

**Understanding Harmony in the Human Being**

Understanding human being as a co-existence of the Self and Body ;

Understanding, exploring and distinguishing between the needs of Self and Body , Understanding the Body as an instrument of Self; Understanding Harmony in the Self, Exploring Sources of Imagination in the Self, Harmony of the Self with the Body, Program to ensure self-regulation and Health, Exploring Harmony of Self with the Body.

## Unit 3

**Understanding Harmony in the Family and Society**

Harmony in the Family – the Basic Unit of Human Interaction, 'Trust' – the Foundational Value in Relationship, Exploring the Feeling of Trust, 'Respect' – as the Right Evaluation, Exploring the Feeling of Respect,Other Feelings, Justice in Human-to-

Human Relationship, Understanding Harmony in the Society, Vision for the Universal Human Order, Exploring Systems to fulfill Human Goals.

## Unit 4

**Understanding Harmony in the Nature and Existence, Implications of the Holistic Understanding – a Look at Professional Ethics:**

Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfillment among the Four Orders of Nature, Exploring the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, the Holistic Perception of Harmony in Existence, Exploring Co-existence in Existence. Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct,Exploring Ethical Human Conduct, A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in Professional Ethics, Exploring Humanistic Models in Education,Holistic Technologies, Production Systems and Management Models-Typical Case Studies, Strategies for Transition towards Value-based Life and Profession, Exploring Steps of Transition towards Universal Human Order.

**Note: The paper setter will set the paper as per the question paper templates provided.**

**READINGS:**

**Text Books:**


a. The Textbook - A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1

b. The Teacher's Manual- Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, RR Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53.

c. Professional Ethics and Human Values, Premvir Kapoor, ISBN: 978-93-86173-652, Khanna Book Publishing Company, New Delhi, 2022.


**Reference Books:**


1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi.
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews.
7. Economy of Permanence - J C Kumarappa.
8. Bharat Mein Angreji Raj – Pandit Sunderlal.
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)

| B23-VAC-101 | Personality Development and Soft Skills | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Practical Exam** | **Total** | **Time** |
| **2** | **0** | **0** | **1** | **---** | **100** | **---** | **100** | **3** |
| **Program Objective (PO)** | **To become a person with stable mind, pleasing personality and determination in order to achieve the highest goal.** | | | | | | | |
| **Course Outcomes (CO)** | | | | | | | | |
| **CO1** | Students become aware about leadership. | | | | | | | |
| **CO2** | Students will learn how to improve communication skills | | | | | | | |
| **CO3** | Understand the team building and conflict | | | | | | | |
| **CO4** | Student will learn how to manage the time. | | | | | | | |

**Unit I**

Leadership Introduction to Leadership, Leadership Power, Leadership Styles, Leadership in Administration. Interpersonal: Introduction to Interpersonal Relations, Analysis Relations of different ego states, Analysis of Transactions, Analysis of Strokes, Analysis of Life position.

**Unit II**

Communication: Introduction to Communication, Flow of Communication, Listening, Barriers of Communication, How to overcome barriers of communication.

Stress: Introduction to Stress, Causes of Stress, Impact Management Stress, Managing Stress.

**Unit III**

Group Dynamics and team Building: Importance of groups in organization, Interactions in group, Group Decision Taking, Team Building, Interaction with the Team, How to build a good team?

Conflict: Introduction to Conflict, Causes of Conflict, Management Managing Conflict.

**Unit IV**

Time Management: Time as a Resource, Identify Important Time Wasters, Individual Time Management Styles, Techniques for better Time Management.

Motivation: Introduction to Motivation, Relevance and types of Motivation, Motivating the subordinates, Analysis of Motivation.

**Suggested reading**


- E.Berne, Games People Play, Grove Press Inc., 1964; Penguin, 1968.
- Hargreaves, G. Stress Management, Marshall Publishing, London 1998
- Barker D, TA and Training, Gower Publishing Company Ltd., 1982.
- Jongewardm D & Seyer P C, Choosing Success, John Wiley & Sons Inc.1978
- Arnold, JHC Feldman, D.C. Organizational Behaviour IRWIN/McGRAW-HILL 1986
- Chandan, J.S., Organizational Behaviour. Vikas Publishing House PVT LTD 1994
- Statt, D.A. Using Psychology in Management Training, Taylor and Francis Inc.2000
- Luthans F., Organisational Behaviour, IRWIN/McGRAW-HILL 1998

| B23-BSC-102 | Introduction to Electromagnetic Theory | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time** |
| **3** | **1** | **-** | **4** | **70** | **30** | **100** | **3h** |
| **Purpose** | **To introduce the fundamentals of electromagnetic theory to the students for applications in Engineering field.** | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO 1** | **Introduce the basic concepts of Electrostatics in vacuum.** | | | | | | |
| **CO 2** | **Introduce the basic concepts of Magnetostatics in vacuum.** | | | | | | |
| **CO 3** | **Discuss electrostatics and magnetostatics in linear dielectric medium.** | | | | | | |
| **CO 4** | **Basics of Maxwell's equations and electromagnetic waves.** | | | | | | |

**Unit - I**

**Electrostatics in Vacuum:** Calculation of Electric Field: Coulomb's law, Continuous charge distribution; Divergence and Curl of Electrostatic Fields: Field lines, flux, Gauss's law, Applications of Gauss's law; Electrostatic Potential: Comments on potential, Poisson's and Laplace's Equation, the potential of a localized charge distribution; Electrostatic Boundary Conditions; Work and Energy in Electrostatics: the work done to move a charge, the energy of a point and continuous charge distribution, Conductors: basic properties, induced charges.

**Unit - II**

**Electrostatics in a Linear Dielectric Medium:** Polarization: dielectrics, induced dipoles, alignments of polar molecules; The field of a Polarized Object: bound charges and its physical interpretation; The Filed Inside a Dielectric; The Electric Displacement: Gauss's law in the presence of dielectrics, A deceptive parallel, Boundary conditions; Linear Dielectrics: Susceptibility, Permittivity, dielectric constant, Boundary value problems with linear dielectrics, Energy in dielectric systems, Forces in dielectrics.

**Unit - III**

**Magnetostatics:** The Lorentz Force Law: magnetic fields, magnetic forces, currents; Biot- Savart law, Divergence and Curl of magnetic filed, Magnetic Vector Potential: vector potential, magnetostatic boundary conditions, multiple expansion of vector potential.

**Magnetostatics in a linear magnetic:** Magnetization: Effect of magnetic field on atomic orbits; The Field of a Magnetized Object: Bound currents, Physical interpretation of bound currents; The Auxiliary Magnetic Field: Ampere's law in magnetized materials, A deceptive parallel, Boundary conditions; Linear and Nonlinear Media: magnetic susceptibility and permeability, ferromagnetism.

**Unit - IV**

**Faraday's law:** Electromotive Force: Ohm's law, Motional emf; Electromagnetic Induction: Faraday's law, The inducedelectric field, inductance, energy in magnetic fields.

**Maxwell's Equations:** Electrodynamics before Maxwell, How Maxwell fixed Ampere's law, Maxwell's equations,Maxwell's equations in matter.

**Electromagnetic Waves:** Electromagnetic Waves in Vacuum: the wave equation for electric and magnetic field;Electromagnetic Waves in Matter: propagation in linear media, Basic concepts of wave guide, Coaxial cables.

**Suggested Books:**


1. David J. Griffiths, Introduction to Electrodynamics, Pearson Education.
2. Halliday and Resnick, Physics
3. W. Saslow, Electricity, Magnetism and Light
4. Bhattacharya &Nag, Engineering Physics


**Note: The paper setter will set the paper as per the question paper templates provided.**

| B23-BSC-112 | Electromagnetic Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **Practical Exam** | **Internal Assessment** | **Total** | **Time** |
| **-** | **-** | **2** | **1** | **60** | **40** | **100** | **3h** |
| **Purpose** | **To acquaint the students with the basic phenomenon related to Electromagnetic Theory.** | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | **To make the students familiar with the experiments related with electromagnetism.** | | | | | | |
| **CO2** | **To understand the basic concepts related to electromagnetic induction** | | | | | | |

**Note: Student will be required to perform at least 10 experiments out of the following list.**

1. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee'sapparatus.
2. To study induced e.m.f. as a function of velocity of magnet.
3. To study the growth and decay of current in a LR circuit using magnetic core inductor.
4. To find the coefficient of self-inductance by Rayleigh's method.
5. To find the coefficient of mutual inductance of two coils.
6. To determine the magnetic induction field between the pole pieces of an electromagnet.
7. To study Bio-Savart's law.
8. To study the dependency of magnetic field on coil diameter and number of turns.
9. To investigate the equipotential liens of electric fields.
10. To draw the equipotential lines of bar electrode.
11. To draw the equipotential lines for ring electrode.
12. Verification of Farady and Lenz's law of induction by measuring the induced voltage as function of time.
13. Measurement of induced voltage impulse as a function of the velocity of magnet.
14. To determine the dielectric constant of different dielectric materials.
15. To measure the spatial distribution of the magnetic field between a pair of identical coils in Helmholtzarrangement.
16. To investigate the spacing between coils at which magnetic field is uniform and to measure its spatialdistribution.

**Suggested Books:**


1. C.L.Arora, B. Sc. Practical Physics, S. Chand.
2. B.L. Worshnop and H, T, Flint, Advanced Practical Physics, KPH.
3. S.L. Gupta & V. Kumar, Practical Physics, PragatiPrakashan.

| B23-ESC-102 | ENGINEERING GRAPHICS AND DESIGN (B. Tech. Semester-I/II) | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time (Hrs.)** |
| **1** | **-** | **-** | **1** | **70** | **30** | **100** | **3** |
| **Purpose** | To draw and interpret various projections of 1D, 2D and 3D objects.<br>To understand the basics of AUTOCAD and perform exercises. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO 1** | Students will be able to draw the projections of points and straight lines | | | | | | |
| **CO 2** | Students will be able to understand and draw the projections of planes and regular solids. | | | | | | |
| **CO 3** | Students will be able to understand the sectioning of solids and development of surfaces. | | | | | | |
| **CO 4** | Students will be able to draw the isometric projections and know different commands used in AUTOCAD. | | | | | | |

## UNIT-I

**Introduction, Projection of Points:**

Introduction to Engineering Equipment's, Elements of Engineering Drawing, Types of Lines, Various types of projections, First and third angle systems of orthographic projections.
Projections of points in different quadrants.

**Projections of straight lines** – parallel to one or both reference planes, contained by one or both planes, perpendicular to one of the planes, inclined to one plane but parallel to the other plane, inclined to both the planes, true length of a line and its inclinations with reference planes, traces of a line.

## UNIT-II

**Projection of planes:**

Introduction, types of planes, Projection of planes by change of position method only, projection of plane perpendicular to a plane, with axis parallel to both planes, with axis parallel to one plane and inclined to the other plane.

**Projection of Regular Solids:**

Types of solids, Projections of Polyhedra Solids and Solids of Revolution – in simple positions with axis perpendicular to a plane, with axis parallel to both planes, with axis parallel to one plane and inclined to the other.

## UNIT-III

**Sections and Sectional Views of Right Regular Solids:**

Sectional views of simple right regular solids like prism, pyramid, Cylinder and Cone.

**Development of Surfaces:**

Development of surfaces of Right Regular Solids-Prism, Pyramid, Cylinder and Cone;

## UNIT-IV

**Isometric/Orthographic Projections and CAD commands:**

Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions;
Solid works basics; Basic Commands: Line, Point, Rectangle, Polygon, Circle, Arc, Ellipse, Polyline
Basic editing Commands: Extrude Bose, Revolve Bose, Copy, Offset, Fillet, Chamfer, Trim, Extend, Mirror Display Commands: Zoom, Pan, Redraw, and Regenerate Simple dimensioning and text, simple exercises.

**Text Book**

1. Engineering Graphics using AUTOCAD 2000: T. Jeyapoovan, Vikas Publishing House.
2. Machine Drawing: Dr Basudeb Bhattacharyya, Oxford University Press, New Delhi

**Reference Books**

1. Engineering Drawing: Amar Pathak, Dreamtech Press, New Delhi.
2. Engineering Drawing: Plane and Solid Geometry: N.D. Bhatt and V.M. Panchal, Charotar Publishing House.
3. Thomas E. French, Charles J. Vierck, Robert J. Foster, "Engineering drawing and graphic technology", McGraw Hill International Editions.
4. Engineering Graphics and Drafting: P.S. Gill, Millennium Edition, S.K. Katariaand Sons.
5. A Primer on Computer aided Engineering Drawing-2006, published by VTU, Belgaum.

| B23-ESC-106 | Engineering Graphics and Design Lab (B.Tech. Semester-I/II) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Practical Exam** | **Total** | **Time (Hrs.)** |
| **0** | **0** | **4** | **2** | **0** | **40** | **60** | **100** | **3** |
| **Purpose** | To make student practice on engineering graphics and design software and provide exposure to the visual aspects of engineering design. | | | | | | | |
| **Course Outcomes** | | | | | | | | |
| **CO 1** | **Students will be able to understand the user interface and toolboxes in Solidworks software.** | | | | | | | |
| **CO 2** | **Students will be able to customize settings of Solidworks software and produce 2D drawings using Solidworks.** | | | | | | | |
| **CO 3** | **Students will be able to practice & learn performing various operations in Solidworks and create 3D designs.** | | | | | | | |
| **CO 4** | **Students will be able to make assembly and create a simple design project.** | | | | | | | |

**Module 1: Overview of SolidWorks:**
Listing the computer technologies that impact on graphical communication, Demonstrating Knowledge of the theory of SolidWorks software: the Menu Bar; the SOLIDWORKS Menus; Quick Access Tools; Command Manager; Feature Manager Design Tree; Heads-Up View Toolbar; Graphics Area; Task Pane; Status Bar; Quick Access Tools; The name of the currently open file; The search prompt (search Commands, Help, Files etc.); User login credentials; SOLIDWORKS Help; Application window options (minimize, maximize, close).
**Module2: Customization & SolidWorks Drawing in 2D:**
Setup of the drawing page and the printer, including scale settings, setting up of document units and drawing limits; ISO and ANSI standards for coordinate dimensioning and tolerancing; Orthographic constraints, Snap to objects manually and automatically; Trim entities; convert entities.
Sketch; Evaluate; SOLIDWORKS Add-Ins; Producing drawings by using various coordinate input entry methods to draw line, rectangle, circle, slots, arcs, conic sections, spline, polygons etc; smart dimensions; applying annotations to drawings; modifying various entities (viz line, rectangle, circle, slots, arcs, conic sections, spline, polygons etc.); 2D Fillet and chamfer; 2D mirror; linear sketch pattern.
**Module3: Miscellaneous operations and 3D designs:**
Drawing; Annotation; Sketch; Markup; Evaluate; SOLIDWORKS Add-Ins; Sheet Format; Features (or Assembly, in an Assembly file);
3D entities (boss and cuts): Extrude boss/base/cut, revolve boss/base/cut, swept boss/base/ cut, Lofted boss/base/cut, Boundary boss/base/cut; 3D Fillet and Chamfer; 3D mirror; 3D linear and circular patterns; reference geometry.
**Module4: Assembly & creating a simple design project**:
Drawing annotation, Solidworks modelling of parts and assemblies; Geometry and topology of engineered components: creation of engineering models and their presentation in standard 3D; Use of SolidWorks software for creating parts and assemblies: Wheel support assembly, V-Block assembly etc. Applying colour coding to parts and assemblies; meshed topologies for engineering analysis and tool-path generation for component manufacture; geometric dimensioning and tolerancing
**Text Book**

1. Beginner's Guide to SOLIDWORKS 2021 - Level II: Sheet Metal, Top Down Design, Weldments, Surfacing and Molds 1st Edition - by Alejandro Reyes; SDC Publications; 1st edition (March 4, 2021).
2. SOLIDWORKS 2021: A Step-By-Step Tutorial Guide for Beginners (Mixed Units) - by SDCAD Academy.

**Reference Books**

1. SOLIDWORKS 2019: A Power Guide for Beginners and Intermediate User Paperback – March 6, 2019 by CADArtifex, John Willis, Sandeep Dogra.
2. Solidworks for Beginners: Getting Started with Solidworks Learn by Doing New Edition 2018 Paperback – October 8, 2018 by Arsath Natheem.

| B23-ESC-103 | | Basic Electrical and Electronics Engineering | | | | | |
|---|---|---|---|---|---|---|---|
| Lecture | Tutorial | Practical | Credit | End Semester Exam | Internal Assessment | Total | Exam Time |
| 3 | 1 | `- | 4 | 70 | 30 | 100 | 3 Hour |
| Course Outcomes | | | | | | | |
| CO 1 | Deals with DC networks, AC fundamentals & AC response of RLC circuits. | | | | | | |
| CO 2 | Deals with introductory Balanced Three Phase Power System analysis, magnetic circuits and Single-Phase Transformer. | | | | | | |
| CO 3 | Explains the Basics of Electrical Machines (AC/DC). | | | | | | |
| CO 4 | Study of Introduction to Analog Electronics & Digital Electronics Fundamentals. | | | | | | |

**UNIT-I**

**Review of D.C. circuits**: Ohm's Law, junction, node, circuit elements classification: Linear & nonlinear, active & passive, lumped & distributed, unilateral & bilateral with examples. KVL, KCL, Nodal analysis, Star-Delta transformation of set of resistors.

**DC Network Theorems:** Superposition, Thevenin's, Norton's theorems in DC networks containing both voltage and current sources and Maximum power transfer theorem in a resistive network.

**AC Fundamentals & AC Circuit:** AC signal, Average and RMS values of sinusoidal AC, polar & rectangular form of representation phasor quantities. Addition & subtraction of two or more phasor sinusoidal quantities using the component resolution method. Steady-state AC response of R/L/C, RL, RC series ckts, P.F., active, reactive & apparent power. Qualitative analysis of Frequency response of series & parallel RLC circuit.

**UNIT-II**

**Balanced 3-Phase AC Circuits**: Advantages of 3-phase system, Star and Delta connections and their Line and Phase voltage/current relationships, three-phase power & its measurement using the 2-wattmeter method.

**Single phase transformer (only qualitative analysis)**: MMF, Reluctance and flux flow in a magnetic circuit. Transformer: Principle – Construction - Emf equation - Phasor diagram and Equivalent Circuit, Losses in a transformer, Maximum efficiency condition, OC/SC Test & direct load test.

**UNIT-III (Only Qualitative Analysis)**

Principle of Dynamo for generation of AC. Relation between synchronous speed, number of field poles and frequency. Principle of motoring. Torque & Mechanical Power developed at a rotating shaft & B.H.P.

**DC Machines:** Constructional parts & principles of working of DC Machines, Generated and back EMF, Types of DC machines, Speed Control of DC shunt Motor, applications.

**3-Phase Induction Motor:** Basic working principle & construction of a 3- phase Induction motor, slip & advantages. Phase sequence and its importance.

**Synchronous Machines:** Basic principle of working of Alternator and synchronous motor.

**UNIT-IV**

**Analog Electronics Basics (Only Qualitative Analysis):** PN junction diode characteristics: forward and reverse bias, breakdown – barrier potential, Zener diode, Basic Rectifier circuits: half wave and full wave, Introduction to BJT: characteristics curve and region of operation.

**Digital Fundamentals:** Diode as a binary switch, decimal to binary number representation, addition subtraction and basic Boolean algebra, Basic Logic Gates with truth table.

**Suggested Books:**


1. Basic Electrical Engg: A complete Solution by Vijay Kumar Garg, Wiley India Ltd.
2. Electrical Engg. Fundamentals by Rajendra Prasad, PHI Pub.
3. Basic Electrical and Electronics Engg. by S.K. Sahdev, Dhanpat Rai & Co./Pearson.
4. A.K. Maini, Digital Electronics, Wiley India


**Note: An approved question paper template is to be provided to the paper setter.**

| B23-ESC-108 | | Basic Electrical and Electronics Engineering Lab | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **Practical** | **Credit** | **Internal Assessment** | **Practical Exam** | **Total** | **Exam Time** |
| **-** | **-** | **2** | **1** | **40** | **60** | **100** | **3 Hrs** |
| **Purpose** | **To familiarize the students with introductory Electrical & Electronics Engineering practicals.** | | | | | | |
| | **Course Outcomes** | | | | | | |
| **CO1** | **Deals with various DC network theorems to analyse linear circuits. Deals with the steady-state frequency response of RLC circuit parameters solution techniques** | | | | | | |
| **CO 2** | **Deals with introductory Single-Phase Transformer & 3 phase power measurement practicals** | | | | | | |
| **CO 3** | **Deals with the introductory practicals of various types of motors.** | | | | | | |
| **CO 4** | **Deals with various introductory experiments w.r.t Analog & Digital Electronics.** | | | | | | |

**LIST OF EXPERIMENTS**

**LIST-I**

1. To verify KVL and KCL.
2. To verify the Superposition theorem on a linear circuit with at least one voltage & one current source.
3. To verify Thevenin's Theorem on a linear circuit with at least one voltage & one current source.
4. To verify Norton's Theorem on a linear circuit with at least one voltage & one current source.
5. To study frequency response characteristics of a series R-L-C circuit on CRO and determine BW, resonant frequency & maximum current.
6. To study frequency response characteristics of a parallel R-L-C circuit on CRO and determine resonant frequency & minimum current.
7. To perform O.C. and S.C. tests on a single-phase transformer.
8. To perform a direct load test on a single-phase transformer and plot load v/s efficiency characteristics.
9. Measurement of power of a 3-phase balanced load by two-wattmeter method.
10. To perform speed control of the DC shunt motor.
11. To study cut-section models of various generators and motors.
12. To perform starting & reversal of direction of a three-phase induction motor.
13. Starting and running of a 3-phase synchronous motor.
14. To study various Safety measures: Need of Earthing, prevention & precautions against electric shock and electric hazards, shock treatment. General Precautions followed in performing practicals in BEEE Lab.

**LIST-II**

15. To study the VI characteristics of the p-n diode in forward and reverse bias and find the threshold voltage from the VI curve.
16. To study the operation of half-wave and full-wave rectifiers and observe the output waveform.
17. To experimentally plot the input and output characteristics of a given BJT transistor in CE/CB/CC configuration.
18. Study and realization of Logic gates AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR (any four).

**Note: At least 7 experiments from the List - I & 2 experiments from the List -II to be performed during the semester.**

| B23-VAC-102 | IDEA WORKSHOP | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal assessment** | **Total** | **Exam Time** |
| **2** | **-** | **`-** | **1** | **--** | **100** | **100** | **3 Hour** |
| **Course Outcomes** | | | | | | | |
| **CO 1** | Student will be familiarized with different types of electronic components and basic concepts of soldering. classification and component mounting techniques of PCB. | | | | | | |
| **CO 2** | Student will be able to understand classification and component mounting techniques of PCB. | | | | | | |
| **CO 3** | Students will be able to understand common mistakes and their debugging during PCB designing Students will be able to design PCB using Autodesk Eagle. | | | | | | |
| **CO 4** | Students will be able to understand 3D printing and its prototypes. | | | | | | |

**Unit -I**

Electronic component familiarization, Understanding electronic system design flow. Familiarization and use of basic measurement instruments - DSO including various triggering modes, DSO probes, DMM, LCR bridge, Signal and function generator. Soldering using soldering iron/station.

**Unit-II**

Introduction to PCB: PCB Classifications: Based on Number of copper layers, Thickness of copper layer, Substrate material, Different layers of PCB, Mounting techniques of components on PCB, Keywords Used in PCB Design and their Description, Methods of grounding in PCB. Common electronics components and devices used in PCB design.

**Unit -III**

Common mistakes made during PCB designing. Inspection testing procedures to ensure the quality of PCB. Internationally accepted standards for PCB design and manufacturing, Complete steps for designing PCB. PCB design using Autodesk Eagle.

**Unit -IV**

3D printing and prototyping technology – 3D printing using FDM, SLS and SLA. Basics of 3D, scanning, point cloud data generation for reverse engineering, Prototyping using subtractive cutting processes, 2D and 3D Structures for prototype building using Laser cutter and CNC routers.

## Books and references:


1) Make Your Own PCBs with EAGLE: From Schematic Designs to Finished Boards, 2nd Edition by Dr. Simon Monk, Duncan Amos, ISBN: 9781260019193, Publication Date & Copyright: 2017 McGraw-Hill Education.
2) Designing Circuit Boards with EAGLE( Make High-Quality PCBs at Low Cost) Binding: Paperback Author: MatthewScarpino Publisher: PrenticeHall.
3) Introduction to Photovoltaic System Design by John R. Balfour, Released November 2011 Publisher(s): Jones & Bartlett Learning, ISBN: 9781449624682.

3D Printing & Design, Dr. Sabrie Soloman, ISBN: 978-9386173768, Khanna Book Publishing Company, New Delhi.

| B23-VAC-104 | IDEA WORKSHOP LAB | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal assessment** | **Practical Exam** | **Total** | **Exam Time** |
| **-** | **-** | **3** | **1** | **--** | **100** | **--** | **100** | **3 Hour** |

List of Experiments:

1. Familiarization with electronic components like diodes and transistors, MOSFETS.
2. Familiarization with DSO and function generator.
3. Familiarization with soldering.
4. Schematic diagram of PCB designing using Autodesk Eagle.
5. Routing of components on PCB using Autodesk Eagle.
6. Designing of double layer PCB using Autodesk Eagle.
7. To study 3D printer and develop a 3D model of real object using 3 D printer.
8. To study 3D scanner and create a 3D model using 3D scanner.
9. To perform 2D profile cutting of press fit box/casing in acrylic (3 or 6 mm thickness)/cardboard, MDF (2 mm) board using laser cutter & engraver.

| B23-BSC-105 | Chemistry | | | | | | |
|---|---|---|---|---|---|---|---|
| L | T | P | Credit | End Semester Exam | Internal Assesment | Total | Time |
| 3 | 1 | 0 | 4 | 70 | 30 | 100 | 3h |
| Purpose | To acquaint the students with the basic phenomenon/concepts of chemistry, the student faces during course of their study in the industry and Engineering field | | | | | | |
| CO1 | An insight into atomic and molecular orbitals and bonding in molecules | | | | | | |
| CO2 | Knowledge of basic concept of spectroscopic techniques for identification of molecules | | | | | | |
| CO3 | To understand basics of thermodynamics and periodic properties | | | | | | |
| CO4 | To understand basics of stereochemistry and various organic reactions | | | | | | |

**UNIT -I**

Molecular orbitals of diatomic molecules. Equations for atomic and molecular orbitals. Energy level diagrams of diatomic molecules ($O_2$, $N_2$, CO, NO, CN, HCl and HF). Pi-molecular orbitals of butadiene. Concept of aromaticity. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.

**UNIT -II**

Spectroscopic techniques and applications: Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational spectroscopy and its applications. Nuclear magnetic resonance and magnetic resonance imaging, surface characterization techniques. Diffraction and scattering.

**UNIT -III**

Ionic, dipolar and van Der Waals interactions. Equations of state of real gases and critical phenomena. Thermodynamic functions: Internal energy, entropy and free energy. Estimations of entropy and free energies. Free energy and EMF. Cell potentials, the Nernst equation and its applications. Periodic properties - Effective nuclear charge, electronic configurations, atomic and ionic sizes, ionization energies, electron affinity and electronegativity, polarizability, oxidation states, coordination numbers and geometries of $CCl_4$, $PCl_5$, $H_2O$, $NH_3$, $SF_6$, $IF_7$ (as per VSEPR theory).Hard soft acids and bases.

**UNIT - IV**

Stereochemistry: Representations of 3 dimensional structures, structural isomers and stereoisomers, configurations and symmetry and chirality, enantiomers, diastereomers, optical activity, absolute configurations and conformational analysis (Ethane, Butane and cyclohexane).

Organic reactions : Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, cyclization and ring openings.

Text/Reference Books:

1. AICTE's Prescribed Textbook: Chemistry – I with Lab Manual, Khanna Book Publishing.
2. Engineering Chemistry, by Manisha Agrawal.
3. University chemistry, by B. H. Mahan.
4. Chemistry: Principles and Applications, by M. J. Sienko and R. A. Plane.
5. Fundamentals of Molecular Spectroscopy, by C. N. Banwell.
6. Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan. AICTE Model Curriculum for UG Degree Course in Computer Science and Engineering 54
7. Physical Chemistry, by P. W. Atkins.

| B23-BSC-109 | APPLIED MATHEMATICS-I | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time** |
| **3** | **1** | **-** | **4** | **70** | **30** | **100** | **3 h** |
| **Purpose** | This course aims to acquaint Biotechnology Engineers with fundamental concepts and tools in Limit, Continuity, Differential & Integral Calculus, and Complex Numbers, enabling them to progressively develop their mathematical proficiency for tackling advanced mathematical principles and applications relevant to their field. | | | | | | |

| **Course Outcomes** | |
|---|---|
| **CO1** | To introduce the idea of sets, relations, functions, trigonometric functions, inverse trigonometric functions, these concepts are prerequisite to learn the concepts of differentiation and integration. |
| **CO 2** | To introduce the Complex numbers which is fundamental to solve any kind of quadratic equations, Limit is precondition to understand the concept of rate of change and derivative. |
| **CO 3** | To develop the essential tool of Continuity and Differentiability needed in evaluating higher order derivatives of functions. |
| **CO 4** | To introduce the tools of Indefinite and Definite integrals of functions in a comprehensive manner that are used in various techniques dealing engineering problems. |

**UNIT-I** (10 hrs)

**Sets, Relations, Functions**

**Sets and its types:** Operations on sets, complement of a set, Cartesian Product of sets, relations , functions, types of functions, **Trigonometric functions:** Introduction, Trigonometric functions, Trigonometric functions of sum and difference of two angles, Trigonometric equations, **Inverse Trigonometric functions:** Introduction, basic concepts and its properties.

**UNIT-II** (10 hrs)

**Pre-Calculus**

**Complex Numbers:** Introduction, Algebra of Complex Numbers, Modulus and the conjugate of a complex number, quadratic equations,

**Limits and Derivatives:** Introduction, Limits, Limits of Trigonometric Functions, Derivatives (single variable).

**UNIT-III** (10 hrs)

**Differential Calculus**

**Continuity and Differentiability**: Introduction, Continuity, Differentiability, Exponential and Logarithmic functions, Logarithmic differentiation, Derivatives of functions in parametric forms, second order derivatives, **Application of Derivatives (single variable)**: Increasing and decreasing functions, Maxima and Minima.

**UNIT-IV** (10 hrs)

**Integral Calculus**

**Integrals:** Introduction, Integration as an Inverse process of Differentiation, Method of Integration, Integration by Partial Fractions, Integration by Parts, **Definite Integrals**: Fundamental theorem of Calculus, Evaluation of Definite Integrals by Substitution, properties of Definite Integrals.

**Suggested Books:**


1. G. B. Thomas, R. L. Finney: Calculus and Analytic Geometry, Pearson Education.
2. Mathematics Textbook for Class 11th& 12th by NCERT.
3. Howard Anton: Calculus, Wiley Publication.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 2023


**Note: The paper setter will set the paper as per the question paper templates provided.**

| B23-BSC-103 | Applied Physics | | | | | | |
|---|---|---|---|---|---|---|---|
| L | T | P | Credit | End Semester Exam | Internal Assessment | Total | Time |
| 3 | 1 | - | 4 | 70 | 30 | 100 | 3h |
| Purpose | To introduce the basics of physics to the students for applications in Engineering field. | | | | | | |
| Course Outcomes | | | | | | | |
| CO 1 | Introduce the fundamentals of interference and diffraction and their applications. | | | | | | |
| CO 2 | To make the students aware of the importance of polarization and Ultrasonics. | | | | | | |
| CO 3 | Introduce the basics concepts of laser and its applications. | | | | | | |
| CO 4 | To familiarize with concepts of nuclear radiations and its biological effects. | | | | | | |

Unit I

**Interference**: Principle of Superposition, Conditions for interference, Division of wave-front: Fresnel's Biprism and Applications, Division of amplitude: Wedge-shaped film, Newton's rings and Applications, Michelson Interferometer and Applications.

**Diffraction**: Types of diffraction, Fraunhofer diffraction at a single slit, Intensity distributiondue diffraction grating, determination of wavelength; Dispersive power and resolving power of diffraction grating.

Unit II

**Polarization:** Polarization of transverse waves, Plane of polarization, Polarization by reflection, Double refraction, Nicol Prism, Quarter and half wave plate, Specific Rotation, Laurent 's half shade polarimeter, Biquartz polarimeter.

**Ultrasonics**: Ultrasonic waves, Properties of ultrasonic waves, Production of ultrasonic waves: Magnetostriction and Piezoelectric methods, Detection of ultrasonic waves, Measurement of velocity of ultrasonic waves, Applications of ultrasonic waves.

Unit III

**Laser:** Einstein's theory of matter radiation interaction and A and B coefficients; amplification of light by population inversion, different types of lasers: gas lasers (He-Ne, $CO_2$), solid-state lasers (ruby, Neodymium), dye lasers; Properties of laser beams: mono-chromaticity, coherence, directionality and brightness, laser speckles, applications of lasers in science, engineering and medicine.

Unit IV

**Nuclear radiations and its Biological Effects:** Classification of nuclear radiations, Interaction of charged particle (light and heavy) and gamma radiations with matter (basic concepts), Dosimetric units, Relative Biological Effectiveness (RBE), Typical doses from commons sources in the environment, Biological Effects, Maximum Permissible Dose, (MPD), Shielding, Radiation safety in the nuclear radiation laboratory.

**Biomaterials:** Introduction, Classification of biomaterials, Applications.

**Suggested Books:**


1. Applied Physics for Engineers, Wiley India Pvt. Ltd.
2. Concepts of Modern Physics (5th edition), Tata McGraw-Hill Publishing Company Limited.
3. A Textbook of Optics, S. Chand & Company Ltd.
4. Techniques for Nuclear and Particle Physics Experiments: A How-to Approach, Springer-Verlag.
5. Introduction to Nuclear and Particle Physics, PHI Learning Private Limited.
6. Biomaterials: The intersection of Biology and Materials Science, Pearson, New Delhi.


**Note: The paper setter will set the paper as per the question paper templates provided.**

| B23-BSC-113 | Applied Physics Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| L | T | P | Credit | Practical Exam | Internal Assessment | Total | Time |
| - | - | 2 | 1 | 60 | 40 | 100 | 3h |
| Purpose | To impart the knowledge of basic concepts of Physics in Engineering. | | | | | | |
| Course Outcomes | | | | | | | |
| CO1 | To make the students familiar with the experiments related with interference and diffraction. | | | | | | |
| CO2 | To understand the basic phenomenon of polarization and ultrasonic | | | | | | |
| CO3 | To impart the practical knowledge of the experiments related with resistance using different methods | | | | | | |

**Note: Student will be required to perform at least 10 experiments out of the following list.**

1. To find the wavelength of monochromatic light by Newton's ring experiment.
2. To find the wavelength of sodium light by Michelson's interferometer.
3. To find the resolving power of telescope.
4. To find the wavelength of sodium light using Fresnel bi-prism.
5. To find the wavelength of various colours of white light with the help of plane transmission diffraction grating.
6. To find the specific rotation of sugar solution by using a Polarimeter.
7. To find the frequency of ultrasonic waves by piezoelectric methods
8. To verify Newton's formula and hence to find the focal length of the given convex lens.
9. To find the frequency of A.C. mains by using Sonometer and horse shoe magnet.
10. To find the resistance of a galvanometer by post office box.
11. To find low resistance by Carrey-Foster bridge.
12. To find the value of high resistance by substitution method.
13. To compare the capacitances of two capacitors by De-Sauty's bridge and hence to find the dielectric constantof a medium.
14. To convert a galvanometer into an ammeter of desired range and verify the same.

**Suggested Books:**


1. C.L.Arora, B. Sc. Practical Physics, S. Chand.
2. B.L. Worshnop and H, T, Flint, Advanced Practical Physics, KPH.
3. S.L. Gupta & V. Kumar, Practical Physics, Pragati Prakashan.

| B23-BSC-110 | APPLIED MATHEMATICS-II | | | | | | |
|---|---|---|---|---|---|---|---|
| **L** | **T** | **P** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time** |
| **3** | **1** | **-** | **4** | **70** | **30** | **100** | **3 h** |
| Purpose | This course aims to equip the students with standard concepts and tools that will serve them well towards tackling more advanced level of mathematics while familiarizing them with essential tool of linear algebra, solution of differential equation, utility of higher order derivatives in engineering domain. More precisely, the objectives are as under: | | | | | | |
| Course Outcomes | | | | | | | |
| CO1 | To introduce the essential tool of matrices and linear algebra in a comprehensive manner to solve the large system of linear equations. | | | | | | |
| CO 2 | To introduce effective mathematical tools for the solutions of first order differential equations that model physical processes. | | | | | | |
| CO 3 | To develop the way to solve the ordinary differential equation with higher orders. | | | | | | |
| CO 4 | To extend some concept of differential calculus for more than one variables. | | | | | | |

**UNIT-I** (10 Hrs)

**Linear Algebra:**

Introduction to matrices, its types, algebraic operations, transpose, determinant, minors and adjoint of a matrix. Elementary transformations, Inverse of a square matrix: Cramer's rule, Rank of a matrix, elementary matrices, Gauss Jordon method to find inverse using elementary transformations.

System of Linear equations: General representation, Homogeneous and Non-homogeneous system of linear equations, Consistency of linear system of equations, Gauss Elimination method to solve the system of linear equations.

**UNIT-II** (10 Hrs)

**First order Ordinary differential equations:**

Introduction, order and degree of the differential equation, Formation of differential equation, Solution of the differential equation, Solution of the differential equation with variables separable and differential equations reducible to variable separable form, exact differential equation, and equations reducible to exact differential equations, linear and Bernoulli's equations.

**UNIT-III** (10 hrs)

**Ordinary differential equations of higher orders**

Introduction, complementary function, particular integrals, solution of second and third order linear differential equations with constant coefficients.

**UNIT-IV** (10 hrs)

**Multivariable Calculus:**

Partial derivatives, Total differential, Chain rule for differentiation, Partial derivatives of higher orders, Homogeneous functions, Euler's theorem on homogeneous functions, differentiation of an implicit function, Jacobian, Maxima and minima of a function of two variables, Lagrange's method of undetermined multipliers.

**Suggested Books:**


1. G. B. Thomas, R. L. Finney: Calculus and Analytic Geometry, Pearson Education.
2. H. Anton, Irl C Bivens, Stephen Davis: Calculus 10th Edition, John Wiley & Sons.
3. E. Kreyszig: Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
4. E. Kreyszig and S. Ahuja, Applied Mathematics-II, Wiley India Publication, Reprint 2015.
5. Srimanta Pal and Subodh C. Bhunia, Engineering Mathematics, Oxford University Press.
6. Mathematics Textbook for Class 11th& 12th by NCERT.
7. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 2023


**Note: The paper setter will set the paper as per the question paper templates provided.**

| B23-VAC-106 | Idea Workshop (B.Tech. Biotechnology) Semester II | | | | | | |
|---|---|---|---|---|---|---|---|
| Lecture | Tutorial | Practical | Credit | End Semester Exam | Internal Assessment | Total | Time |
| 2 | - | - | 1 | - | 100 | 100 | 3 Hrs. |
| Purpose | To familiarize the students with various aspects of Biotechnology | | | | | | |
| Course outcomes | | | | | | | |
| CO1 | Student to learn about scope and different techniques of Biotechnology | | | | | | |
| CO2 | To learn the methods of fermentation, bioprocessing and food preservation . | | | | | | |
| CO3 | To learn the Techniques of Plant, Animal culture and Nanotechnology. | | | | | | |
| CO4 | Student will learn about Ethics and applications of Biotechnology | | | | | | |

**Unit 1: Introduction to Biotechnology**

**Overview of biotechnology , Scope of Biotechnology and Future Prospects**
**Introduction to Laboratory safety, Sterilization and Basic Lab Techniques.**

**Unit 2: Microbiology, Food Technology and Bioprocessing**

**Introduction to Microbiology and Aseptic techniques.**

**Introduction to Fermentation Technology and Bioreactor design.**

**Brief Introduction of Upstream and Downstream processing.**
**Introduction to Food Spoilage and Food Preservation Techniques**

**Unit 3: Plant, Animal Biotechnology, Nanotechnology and Ethics**

**A Brief Introduction to Plant and Animal Culture Techniques**

**Introduction to Nanotechnology and Computational Biology**

**Introduction to IPR and Ethics in Biotechnology.**

**Unit 4: Biotechnology Applications**

**Basic Concepts of Biofuel, Biopesticides, Biofertilizers and Biogas.**

**Bioremediation, Composting and Vermicomposting**
**Segregation and disposal of Bio waste**

**Neutraceuticals and Drug Dosage Forms**

**Reference/Text Books:**

**1. Microbiology. Pelczar Jr., M.J.; Chan, E.C.S. and Krieg, N.R. (1993) Tata McGraw Hill, New Delhi.**
**2. Microbiology 5th Edition. Prescott, L.M.; Harley, J.P. and Klein, D.A.(2003) McGraw Hill, USA.**
**3. Foods: Facts and Principles. (2012) N. Shakuntala Manay and M. Shadakshara Swami. New Age International (P) Ltd, Publishers .**
**4. Environmental Biotechnology. Jogland, S.N. (1995) Himalaya Publishing House, New Delhi.**
**5. Environmental Biotechnology: Bhattacharya and Banerjee ( 2007) Oxford University Press.**

| B23-VAC-108 | Idea Workshop Lab (B.Tech. Biotechnology) Semester II | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time** |
| **-** | **-** | **4** | **1** | **-** | **100** | **100** | **3 Hrs.** |
| **Purpose** | **To familiarize the students with various aspects of Biotechnology** | | | | | | |
| **Course outcomes** | | | | | | | |
| **CO1** | **Student to learn about different equipments and techniques of Biotechnology** | | | | | | |
| **CO2** | **To learn the methods of fermentation and fermentor used .** | | | | | | |
| **CO3** | **To learn the methods of adulteration testing in milk and samples.** | | | | | | |
| **CO4** | **Student will learn about waste water treatment and testing methods and will perform some healthcare experiments.** | | | | | | |

1. Study of different biotechnology instruments in laboratories.
2. Study of fermenter and its components.
3. Isolation and identification of industrially important microorganisms.
4. Preparation of Basal Medium.
5. Microbial culturing techniques and staining methods.
6. Testing of various parameters of water/waste water/soil samples.
7. Food Adulteration Testing of milk and different food products.
8.Plant and Animal Tissue culture Techniques
9. Phytochemical activity of medicinal plants parts.
10. Computer aided drug/ pesticide design using bioinformatics tools.
11. Testing of Blood group and haemoglobin in blood samples.
12. Good manufacturing and Laboratory Practices.

Note: Collaboration with Industry/Institute for novel projects/ideas.

Text Books:

**1.** Microbiology- A laboratory manual. 4th edition. Cappuccino J. and Sheeman N. (2000) Addison Wesley, California.
**2.** Environmental Microbiology – A Laboratory Manual Pepper. I.L.; Gerba, C.P. and Brendecke, J.W.(1995) Academic Press, New York.
3. Experiments in Microbiology, Plant Pathology and Biotechnology. 4th Edition. Aneja, K.R. (2003) w Age International Publishers, New Delhi**.**
4. Manual of Industrial Microbiology and Biotechnology. 2nd Edition. Ed. Arnold L. Demain and Julian E. Davies (1999) ASM Press Washington D.C.

| B23-BSC-101 | Semiconductor Physics | | | | | | |
|---|---|---|---|---|---|---|---|
| L | T | P | Credit | End Semester Exam | Internal Assessment | Total | Time |
| 3 | 1 | - | 4 | 70 | 30 | 100 | 3h |
| Purpose | To introduce the fundamentals of solid state physics and its applications to the students. | | | | | | |
| Course Outcomes | | | | | | | |
| CO1 | To make the students aware of basic terminology of crystal structure. | | | | | | |
| CO 2 | Introduce the elementary quantum mechanics, which will be useful in understanding the concepts of solid state physics. | | | | | | |
| CO 3 | Discussion of classical free electron theory, quantum theory and Band theory of solids. | | | | | | |
| CO 4 | Basics and applications of semiconductors. | | | | | | |

**Unit - I**

**Crystal Structure:** Crystalline and Amorphous solids, Crystal Structure: lattice translation vector, symmetry operations, space lattice, basis; Unit cell and Primitive cell, Fundamental types of lattices: two-dimensional and three dimensional Bravais lattices; Characteristics of Unit cells: Simple Cubic (SC), Body Centred Cubic (BCC), Face Centred Cubic (FCC), Hexagonal Close Packed (HCP) structure; Simple crystal structures: Sodium Chloride, Cesium Chloride, Diamond, Cubic Zinc Sulfide; Miller Indices, Bonding in Solids, Point defects in crystals: Schottky and Frenkel defects.

**Unit – II**

**Quantum Theory:** Need and origin of Quantum concept, Wave-particle duality, Phase velocity and group velocity, Uncertainty Principle and Applications; Schrodinger's wave equation: time-dependent and time –independent; Physical Significance of wave function .

**Unit – III**

**Free Electron Theory:** Classical free electron theory: electrical conductivity in metals, thermal conductivity in metals, Wiedemann-Franz law, success and drawbacks of free electron theory; Quantum free electron theory: wave function, eigen values; Fermi-Dirac distribution function, Density of states, Fermi energy and its importance.

**Band theory of Solids:** Bloch theorem, Kronig-Penney Model (qualitative), E versus k diagram, Brillouin Zones, Concept of effective mass of electron, Energy levels and energy bands, Distinction between metals, insulators and semiconductors, Hall effect and its Applications.

**Unit –IV**

**Semiconductors:** Conduction in Semiconductors, Intrinsic Semiconductors: Conductivity of charge carriers, Carrier concentration in intrinsic semiconductors; Extrinsic Semiconductors: n-type semiconductors, p-type semiconductors, charge carrier concentration in extrinsic semiconductors.

**Semiconductor Devices:** The p-n junction diode, Current-voltage characteristics of p-n junction; Half wave and full wave rectifier, The Transistor: NPN and PNP transistor, Basic configuration in common emitter, common base and common collector; Metal-Semiconductor Junction (Ohmic and Schottky).

**Suggested Books:**


1. Applied Physics for Engineers, Wiley India Pvt. Ltd.
2. Introduction to Solid State Physics, John Wiley & Sons. .
3. Concepts of Modern Physics (5th edition), Tata McGraw-Hill Publishing Company Limited.
4. Solid State Physics, New Age International (P) Limited.
5. A Textbook of Quantum Mechanics, McGraw Hill Education (India) Private Limited.
   Introduction to Nanotechnology, John Wiley & Sons.


**Note: The paper setter will set the paper as per the question paper templates provided.**

| B23-BSC-111 | Semiconductor Physics Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| L | T | P | Credit | Practical Exam | Internal Assessment | Total | Time |
| - | - | 2 | 1 | 60 | 40 | 100 | 3h |
| Purpose | To acquaint the students with the basic phenomenon/concepts of solid state physics. | | | | | | |
| Course Outcomes | | | | | | | |
| CO1 | To make the students familiar with the basic phenomenon using practical aspects related with Semiconductor Physics. | | | | | | |
| CO2 | To impart the practical knowledge of the experiments related with quantum theory and Band theory of solids. | | | | | | |

**Note: Student will be required to perform at least 10 experiments out of the following list.**

1. To study the I-V characteristics of a p-n diode.
2. To find the value of Hall Coefficient of semiconductor.
3. To find the value of e/m for electrons by Helical method.
4. To find the band gap of intrinsic semiconductor using four probe method.
5. To find the flashing and quenching potential of Argon and to find the capacitance of unknown capacitor.
6. To find the value of Planck's constant by using photoelectric cell.
7. To find the temperature coefficient of resistance by using Pt resistance thermometer by post office box.
8. To find the ionization potential of Argon/Mercury using a thyratron tube.
9. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee'sapparatus.
10. To study the characteristics of (Cu-Fe, Cu-Constantan) thermocouple.
11. To calculate the hysteresis loss by tracing a B-H curve.
12. To find the frequency of ultrasonic waves by piezoelectric methods.
13. To verify Richardson thermionic equation.
14. To realize half wave and full wave diode rectifier using CRO.

**Suggested Books:**


1. C.L.Arora, B. Sc. Practical Physics, S. Chand.
2. B.L. Worshnop and H, T, Flint, Advanced Practical Physics, KPH.
3. S.L. Gupta & V. Kumar, Practical Physics, PragatiPrakashan.

| B23-ECS-104 | | Basic Electrical Engineering | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Exam Time** |
| **3** | **1** | **`-** | **4** | **70** | **30** | **100** | **3 Hour** |
| **Course Outcomes** | | | | | | | |
| **CO 1** | **Deals with the review of introductory topics and DC network theorems to analyse linear circuits.** | | | | | | |
| **CO 2** | **Deals with AC fundamentals & AC response of RLC circuit combinations.** | | | | | | |
| **CO 3** | **Deals with the introductory Balanced Three Phase Power System analysis, magnetic circuits and Single-Phase Transformer.** | | | | | | |
| **CO 4** | **Explains the Basics of Electrical Machines (AC/DC).** | | | | | | |

**UNIT-I**

**Review of D.C. circuits**: Ohm's Law, junction, node. Circuit elements classification: Linear & nonlinear, active & passive, lumped & distributed, unilateral & bilateral with examples. KVL, KCL, mesh & nodal analyses, Star-Delta transformation of set of resistors.

**DC Network Theorems:** Superposition, Thevenin's, Norton's theorems in DC networks containing both voltage and current sources and Maximum power transfer theorem in a resistive network.

**UNIT-II**

**AC Fundamentals:** AC signal, Average and RMS values of sinusoidal AC, polar & rectangular form of representation phasor quantities. Addition & subtraction of two or more phasor sinusoidal quantities using the component resolution method. Laws of EMI.

**AC Circuit:** Steady-state AC response of R/L/C, RL, RC series ckts, P.F., active, reactive & apparent power. Frequency response of series & parallel RLC circuit.

**UNIT-III**

**Balanced 3-Phase AC Circuits**: Advantages of 3-phase system, Star and Delta connections and their Line and Phase voltage/current relationships, three-phase power & its measurement using the 2-wattmeter method.

**Single phase transformer (only qualitative analysis)**: MMF, Reluctance and flux flow in a magnetic circuit.Transformer: Principle – Construction - Emf equation - Phasor diagram and Equivalent Circuit, Losses in a transformer, Maximum efficiency condition, OC/SC Test & direct load test.

**UNIT-IV(Only Qualitative Analysis)**

Principle of Dynamo for generation of AC. Relation between synchronous speed, number of field poles and frequency. Principle of motoring. Torque & Mechanical Power developed at a rotating shaft & B.H.P. Need of starter.

**DC Machines:** Constructional parts & principles of working of DC Machines, generated and back EMF equation, excitation and types of DC machines, applications, speed Control of DC shunt Motor.

**3-Phase Induction Motor:** Basic working principle & construction of a 3- phase Induction motor, concept of slip, applications. Phase sequence and its importance in industries.

**Synchronous Machines:** Basic principle of working of Alternator and synchronous motor.

**Suggested Books:**


1. Basic Electrical Engg: A complete Solution by Vijay Kumar Garg, Wiley India Ltd.
2. Electrical Engg. Fundamentals by Rajendra Prasad, PHI Pub.
3. Basic Electrical and Electronics Engg. by S.K. Sahdev, Dhanpat Rai & Co./Pearson.
4. A.K. Maini, Digital Electronics, Wiley India


**Note: An approved question paper template is to be provided to the paper setter.**

| B23-ESC-109 | | Basic Electrical Engineering Lab | | | | | |
|---|---|---|---|---|---|---|---|
| L | T | Practical | Credit | Internal Assessment | Practical Exam | Total | Exam Time |
| - | - | 2 | 1 | 40 | 60 | 100 | 3 Hrs |
| Purpose | To familiarize the students with introductory Electrical & Electronics Engineering practicals. | | | | | | |
| | Course Outcomes | | | | | | |
| CO1 | Deals with various DC network theorems to analyse linear circuits. | | | | | | |
| CO 2 | Deals with the steady-state frequency response of RLC circuit parameters solution techniques. | | | | | | |
| CO 3 | Deals with 3 phase power measurement practicals and introductory Single-Phase Transformer experiments. | | | | | | |
| CO 4 | Deals with the practicals of various types of motors & safety measures. | | | | | | |

## LIST OF EXPERIMENTS

1. To verify KVL and KCL.
2. To verify the Superposition theorem on a linear circuit with at least one voltage & one current source.
3. To verify Thevenin's Theorem on a linear circuit with at least one voltage & one current source.
4. To verify Norton's Theorem on a linear circuit with at least one voltage & one current source.
5. To study frequency response characteristics of a series R-L-C circuit on CRO and determine BW, resonant frequency & maximum current.
6. To study frequency response characteristics of a parallel R-L-C circuit on CRO and determine resonant frequency & minimum current.
7. To perform O.C. and S.C. tests on a single-phase transformer.
8. To perform a direct load test on a single-phase transformer and plot load v/s efficiency characteristics.
9. Measurement of power of a 3-phase balanced load by two-wattmeter method.
10. To perform speed control of the DC shunt motor.
11. To study cut-section models of various generators and motors.
12. To perform starting & reversal of direction of a three-phase induction motor.
13. To perform block rotor test on a motor to find the BHP of the running shaft.
14. Starting and running of a 3-phase synchronous motor.
15. To study various Safety measures: Need of Earthing, prevention & precautions against electric shock and electric hazards, shock treatment. General Precautions followed in performing practicals in BEE Lab.

**Note: At least 9 experiments to be performed during the semester.**

| B23-VAC-110 | IDEA Workshop | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End semester Exam** | **Internal Assessment** | **Total** | **Exam Time** |
| **2** | **0** | **`-** | **1** | **--** | **100** | **100** | **3 Hour** |

| **Course Outcomes** | |
|---|---|
| **CO 1** | To learn the hardware of computer and its configuration. |
| **CO 2** | To learn assembling and trouble shooting |
| **CO 3** | To study the network resource and its technology |
| **CO 4** | To configure different server and network in Lab. |

**UNIT-I**

Introduction to Input Output Devices: keyboard, Mouse, Scanner, printer etc. , Introduction to Storage Devices: RAM, ROM, Cache, Secondary storage etc. , computer configutaion, E-mail

**UNIT-II**

Assembling a PC, Basic Trouble shooting during the assembling, Basic troubleshooting of PC, BIOS & Installing Operating System

**UNIT-III**

Introduction to Various types of Cables and Connectors Used in Networking, Introduction to Networking and Networking Concepts, Networking Fundamentals & Network Configuration, Explain network technologies and topology, Explain how devices access local and remote network resources.

**UNIT-IV**

Hubs, Switches, Bridges, Routers, Configuration of IP Address, LAN set up, IP Addressing and IP Classes, Basic Network Troubleshooting, Basics of Network Security, DHCP server, FTP server, Printer Server.

**CC-M1**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **PartA – Introduction** | | | |
| Subject | History | | |
| Semester | 1st | | |
| Name of the Course | Indian History & Culture | | |
| Course Code | B23-HIS-103 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | Senior Secondary (10+2) or equalant in any stream. | | |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Acquaint with the Idea of History in India and Ancient Indian Classical Literature and its Historicity.<br>2. Understand the deep rooted impact of social inequalities based on Religion, Caste &Untouchabilityin shaping historically the Culture(s) of India and the changing Status of Women in Pre-Modern Times<br>3. Grasp the Cultural Assimilation and Cultural Heritage in India with particular reference to the Emergence of Composite Culture; Main Components of Tangible & Intangible Cultureand Historical Tourism in Indian Context.<br>4. Familiar with the Emergence of Civil Societyin Urban Centres and various Cultural Forms and Cultural Expressions like Performing & Visual Arts and Fairs & Festivals. | | |
| Credits | Theory | Practical/Tutorial | Total |
| | 02 | - | 02 |
| Contact Hours | 02 | - | 02 |
| Max. Marks: 50<br>Internal Assessment Marks: 15<br>End Term Exam Marks: 35 | | Time: 3 Hrs. | |

| PartB-Contentsofthe Course | | |
|---|---|---|
| **<u>Instructions for Paper-Setter:</u>**<br>1. Nine questions shall be set in all, two questions from each Unit I-IV and Question No 1, that is, Compulsory Question, by taking CLOs into consideration. Each question shall carry 07 marks.<br>2. The Compulsory Question shall consist of *seven* short answer type questions of 01 marks each which shall be spread over the whole syllabus.<br>3. The candidate shall be required to attempt *five* questions in all selecting one each question from Unit I-IV and the Compulsory Question. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | **Historical Understanding in India**<br>Indian Knowledge Traditions: Idea of History and Concept of Time & Space<br>Ancient Indian Classical Literature and its Historicity: *Vedas, Ramayana, Mahabharata, Puranas*and*Tripatakas* | 7 |
| II | **Social Inequalities in Indian Culture**<br>Feudal Culture in India<br>Religion, Caste and Untouchabilityin Indian Culture(s)<br>Changing Status of Women in Pre-Modern Times | 8 |
| III | **Cultural Assimilation and Cultural Heritage**<br>Emergence of Composite Culture in Medieval Times<br>Main Components of Tangible & Intangible Culture<br>Historical Tourism in Indian Context | 8 |
| IV | **Cultural Forms & Cultural Expressions:**<br>Urban Centresand the Emergence of Civil Society<br>Performing & Visual Arts<br>Fairs & Festivals | 7 |
| V* | **Practical/Tutorial** | - |
| **SuggestedEvaluationMethods** | | |

| | |
|---|---|
| **InternalAssessment:** **15 Marks**<br>➢ **Theory**<br>• Class Participation: 04Marks<br>• Seminar/presentation/assignment/quiz/class test etc.: 04 Marks<br>• Mid-Term Exam: 07 Marks<br>➢ **Practicum** **N.A.**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | **End Term Examination: 35 Marks** |

**PartC-Learning Resources**

**Recommended Books/e-resources/LMS:**


Agarwal, V.S., *Indian Art,* Varanasi, PrithviPrakasahan, 1972.

----------, *PaninikaleenBharatvarsha*, PrithaviPrakashan, Varanasi.

Banga, Indu, ed. *The City in Indian History: Urban Demography, Society & Polity*, Delhi, Manohar, 1991.

Basham, A.L, *The Wonder that was India,* Rupa, Delhi, 1994.

Bhagvadatt, *Vrihad Bharat KaItihas*, PranavPrakashan, New Delhi.

Biswas, S.S., *Protecting the Cultural Heritage* (National Legislations and International Conventions). New Delhi: INTACH, 1999.

Brown, Percy, *Indian Architecture*, Bombay, D.B.Taraporevala Sons & Co, 1940

Chahal, S.K.,*Dalits Patronized: Indian National Congress and the Untouchables of India 1921-1947,* Shubhi Publication, New Delhi, 2002. (Only Introduction & Chapter I)

———, *Hindu Social Reform: Framework of Jotirao Phule* (Only Introduction & Chapter I)

Dinkar, Ramdhari Singh, *SanskritiKe Char Adhyaya,* Sahitya Academy, New Delhi, 1956.

Elliott, Faith Robertson, Elliott, *Gender, Family and Society,* St. Martin press, New York,1996**.**

Harle, James, *The Art & Architecture of the Indian Subcontinent*, Penguin, Hormondsworth, 1988.

Koch, E. *Mughal Art & Imperial Ideology,* Oxford University Press, New York, 2001.

Kumar, Radha, *History of Doing: An Illustrated Account of Movements for Women's Rights &Feminism in India 1880-1990,* Zubaan, 2007

Kumar, Sunil, *The Present in Delhi's Past*, Gyan Publishing House, Delhi 2002.

Lahiri, N., *Marshaling the Past - Ancient India and its Modern Histories*, Permanent Black, Ranikhet, 2012. Chapters 4 and 5.

Lowenthal, David, *Possessed by The Past: The Heritage Crusade and The Spoils of History,* Cambridge, 2010

Parikh, B., *Composite Culture in a Multicultural Society*, NBT, Delhi, 2007.

Mehta, N., *Introduction: Satellite Television, Identity &Globalization in Contemporary India* in N. Mehta, ED, *Television in India*, New York, Routledge, 2008

Mittal, Satish Chand, *BhartiyaSanskritiKe Char Adhyaya,* ABISY, New Delhi, 2018

Mookherjee, Radha, *The Fundamental Unity of India*,Longsman, Calcutta, 1914.

Oberoi, Patricia, *Freedom and Destiny: Gender, Family and Popular Culture in India*, Delhi, 2009

O'Hanlon, Rosalind, *Caste, Conflict and Ideology: Mahatma Jotirao Phule and the Low Caste Protest in Nineteenth Century Western India*

Omvedt, Gail,*Dalits and the Democratic Revolution: Dr. Ambedkar and the Dalit Movement in Colonial India*
Singh, V., *The Human Footprint on Environment: Issues in India*, New Delhi, and Macmillan, 2012
Storey, John, *Cultural Theory and Popular Culture*, London, 2001
Vasudev, V., *Fairs &Festivals, Incredible India Series*, 2007.

**B. A. LL.B. (Hons.) 5- Year Integrated Course**
**IX- Semester**
**Land Laws Including Ceiling and Other Local Laws**

**Paper: 901**

**Internal Assessment:20 Marks**
**Theory: 80Marks**
**Total: 100 Marks**
**Time: 3 hours**

Note:

(a) Nine questions shall be set in all, two questions in each unit I-IV and one compulsory question in unit-V.

(b) The compulsory question in unit-V shall consist of four parts, one from each Unit I-IV.

(c) The Candidate shall be required to attempt five questions in all, selecting one question from each Unit I-IV and question no. 9 in Unit- V shall be compulsory.

(d) Each question in Unit I-IV shall carry 15 marks and question no. 9 in Unit -V shall carry 20 Marks.

**Unit-I**

**The Haryana Land Revenue Act, 1887**

Definitions (Section 3) Exclusion of certain land from operations of the Act (Section 4).
Revenue Officers (Sections 6-22).
Records (Sections 31-47).
Collection of Land Revenue (Sections 61-96).
Partition (Sections 110-126).
Arbitration (Sections 127-135).

**Leading Case: Harish v. Gisha Ram, AIR 1981 SC 695.**

**Unit-II**

**The Haryana Tenancy Act, 1887**

Definitions (Section 4).
Rights of Occupancy (Sections 5-11).
Rent (Sections 12-34).
Relinquishment, Abandonment and Ejectment (Sections 35-51).
Improvement and Compensation (Sections 61-74).
Jurisdiction and Procedure (Sections 75-100).

**Leading Case: Chandu Lal v. Kalia and Goria, 1976 PLJ 548.**

**Unit-III**

**The Haryana Ceiling on Land Holdings Act, 1972**

Preliminary (Sections 1-6).
Ceiling on Land and Acquisition and Disposal of Surplus Area (Sections 7-17).
Appeal, Review and Revision (Sections 18).

**The Haryana Village Common Lands (Regulation) Act, 1961**
Definitions (Section- 2); Lands to which this Act applies (Section- 3).
Vesting of Rights and Regulation of Use and Occupation etc. of Lands (Sections 4-6).
Power to put Panchayat in possession and cancel or vary leases etc. of Lands (Sections 7-12).
Ban of Jurisdiction of Civil Courts (Sections 13-15).

**The Haryana Urban (Control of Rent and Eviction) Act, 1973.**

Definitions (Sec. 2)
Determination of Fair Rent (Sec. 4)
Rights and Duties of Landlord and Tenants (Sec. 6-12)
Eviction of Tenants (Sec. 13)

**Leading Case: Om Parkash v. State of Haryana, 1987 (i) C. L. J. 791 (F.C.).**

## Unit-IV

**The Right of Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.**
Definitions (Section -3)
Determination of Social Impact and Public Purpose (Sec. 4-9)
Special Provision to Safeguard Food Security (Sec. 10)
Notification and Acquisition (Sec. 11-30)
Rehabilitation and Resettlement Award (Sec. 31-42)
Procedure and Manner of Rehabilitation and Resettlement (Sec. 43-47)
National Monitoring Committee for Rehabilitation and Resettlement (Sec. 48-50)
Establishment of Land Acquisition, Rehabilitation and Resettlement Authority (Sec. 51-74)
Apportionment of Compensation (Sec. 75-76)
Payment (Sec. 77-80)
Temporary Occupation of Land (Sec. 81-83)

**The Real Estate (Regulation And Development) Act, 2016**

Registration of Real Estate Project and Registration of Real Estate Agents (Sec. 3-10)
Functions and Duties of Promoter (Sec. 11-18), Rights and duties of Allottees (Sec. 19), the Real Estate Regulatory Authority (Sec. 20-40).

**Leading Case: Yalliyammal and another v. Special Tehsildar (Land Acquisition) and another etc. (2011)10 SCR 293**

**Statutory Material**
Haryana Land Revenue Act, 1887
Haryana Tenancy Act, 1887
The Haryana Ceiling on Land Holdings Act, 1972
The Haryana Village Common Lands (Regulation) Act, 1961.
The Haryana Urban (Control of Rent and Eviction) Act, 1973.
The Right of Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
The Real Estate (Regulation And Development) Act, 2016.

**Suggested Readings**


| | | | |
|---|---|---|---|
| 1. | Aggarwal,a O.P. | : | The Punjab Tenancy Act, 1887 |
| 2. | Aggarwal,a O.P. | : | The Land Revenue Act, 1887. |
| 3. | Neety Kaul | : | Land Laws in Punjab and Haryana. |
| 4. | Narula, D.P. | : | Punjab and Haryana Land Laws. |
| 5. | Jain's | : | The Punjab Village Common Lands (Regulation) Act, 1961. |
| 6. | Baryam Singh Saini | : | Treatise on Village Common Land (Punjab and Haryana) |
| 7. | Aggarawala Om Prakash | : | Compensation for compulsory acquisition of land: law and practice |
| 8. | Om Prakash Aggarawala, Manmohan Lal Sarin | : | Commentary on the Land Acquisition Act: An Exhaustive Section-wise Commentary on the Land Acquisition Act, 1894 (1 of 1894) with State Amendments |
| 9. | Dr. Preeti Bhardwaj | : | Simplified Approach to Land Laws in Haryana |

# CERTIFICATE PROGRAMME IN TRANSLATION FROM ENGLISH TO HINDI

**Preamble:**

The Certificate Course in Translation provides an introduction to the basics of translation from English to Hindi. It aims at imparting the key concepts of theoretical and practical forms, methods and modes of translation to groom an amateur's attempts into those of a professional enthusiast. Thus, this course will provide the basics of translation in general with the theoretical principles and functional elements of translation as a process and a skill for all those who know more than one language.

**Necessity of the Course:**

In straight terms, translation is the area of language and knowledge that creates the connectivity and intersectionality in multiple languages, disciplines and discourses. A career in translation usually involves working from a one source language that one knows fluently and translating back into another which the translator may be familiar with as his or her target language. A career in translation involves writing rather than speaking, although many translators nowadays may use technology also for the tasks like voice recognition. Further, as per later development, the judgments of revenue, judicial courts are also to be written/pronounced in Hindi. Not only this have even the earlier judgments, Acts rules framed there under been also to be translated into Hindi for the ease of public at large.

**The translation as a practical area of knowledge basically aims at:**

- Widening the vistas of knowledge in whichever area or discipline one wants to work.
- Spreading the mainstream ideologies in Linguistic minorities and connecting these bordered and marginalized people with those who seem to dominate the center through language or command on language.
- Increase the leadership in languages around us, in India especially as we have rich heritage of written and spoken languages.
- Increase of the worldwide readership and spreading the native and the local literature as well as disciplinary knowledge to the world outside the state / nation.
- Development of reviews, appreciations, criticism through translation in various languages.
- Evaluation and analysis of research papers, courses and the educational as well as professional documentation.
- Reaching out to the remote corners of the globe in the globalized world.

**Programme Objectives:**

- To acquaintthe studentswiththe requiredcompetence inminimumtwolanguages,one of which has to beEnglish, to become atranslator.
- Tohelpthe studentstounderstandthe norms andmeasuresofagoodandeligible or communicativetranslationtobeginwith,andfurthertheability togroomtheskillof translation into expertise and accuracylevels as higher as possible
- Toexplainthesimilaritiesanddifferencesingoodandcommunicativetranslationandto acquaintthelearnerswiththebetterstandardsoftranslationastheoryaswellaspractice.
- Tosharpenandcultivatetheinterestandabilityinthelearnerstoattempttranslationin the literaryas wellas social media andgain success in their efforts.

- Toencouragethelearners inpracticetoperformastranslatorsinmultiple areasof translationsuchasliterary,academicandsocialmedia,legalandadministrativesystems, commerceand corporateworld.

# DEAN FACULTY OF ARTS & LANGUAGES

## KURUKSHETRA UNIVERSITY, KURUKSHETRA

(Established by State Legislature Act XII of 1956)
(A + Grade, NAAC Accredited)

Syllabi and Scheme of Examination under Credit Based System of

## Certificate Programme in Translation from English to Hindi (Six Months)

To be implemented from the Session 2023-24

Structure, Scheme of Examination, Credits and Teaching Hours of

Certificate Course in Translation (English to Hindi) (Six Months)

| Paper No. | Name of the course | No. of Credits | Teaching hours per week | Examination scheme (Marks) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Theory | Internal assessment | Total marks | Duration of the exam |
| CCT-101 | Introduction to Translation | 4 | 01 | 80 | 20 | 100 | 3 hours |
| CCT-102 | Translation of Official and Legal Documents | 4 | 02 | 80 | 20 | 100 | 3 hours |
| CCT-103 | i) Project Work (Theory) | 4 | 01 | 60 | -- | 100 | ---- |
| | ii) Project Work (Viva-Voce) | | | 40 | -- | | |
| **Total Credits, Hours per week and marks** | | **12** | **04** | **--** | **--** | **300** | -- |

**Duration: 6 Month** **Credits: 12**

| | |
|---|---|
| Paper 1 | Introduction to translation |
| Paper 2 | Translation of official and legal documents |
| Paper 3 | Project Work (official literature only) |

**Detailed Syllabus**

The programme has compulsory practical components and aims at honing the skills of the aspirants in practical translation. The first course Paper CCT-101 focuses on the basics of translation whereas the other two courses have heavy practical components. In the course Paper CCT-102, the distribution of study time for theory and practice shall be in the ratio of 30:70 and Paper CCT-103 shall be completely dedicated to practice.

| Paper | Course Title | Course Details | Credits | Theory | Internal Assessment | Total | Duration of the Exam |
|---|---|---|---|---|---|---|---|
| CCT-101 | Introduction to translation | Unit-1: Meaning,NatureandScopeof Translation<br>Unit-2: Relevanceof Translationinthe ageof Globalization<br>Unit-3: Difficultiesof TranslatingfromEnglishintoHindi<br>Unit-4: DutiesandResponsibilitiesofaTranslator,Limitations of Translation. | 4 | 80 | 20 | 100 | 3 hours |
| CCT-102 | Translation of official and legal documents | Unit-1: Importanceoftranslatingofficial and legal documents.<br>Unit-2: Translationofadministrative and legal terminology.<br>Unit-3: Translationof officialcommunicationvarioustypeso f Official formsandformats.<br>Unit-4:Translationof reports likeadministrativereports,reports of NGOs, corporatehousesandinternational fundingagencieslikeUNICEF,World Bank, DFID,UNDPetc.<br>Unit-5: Translation of legal documents<br>**(Practice inTranslation:One passage of 500 words shallbe chosen fromthese categoriesfortranslation duringthiscourse)** | 4 | 80 | 20 | 100 | 3 hours |
| CCT-103 | i) Project Work (Theory) | Translation of atextof 2500-3000words fromEnglishtoHindi | 4 | 60 | -- | 100 | -- |
| | Ii) Project Work (Viva-Voce) | | | 40 | | | |

**Learning Outcomes:**

Learning Outcomes after completing the course, the learners will be able to:-

- Apply the skills of translation in everyday communication in the fields of law, business, journalism and mass communication, politics and tourism etc.
- Translate simple literary passages in English into Hindi for academic and non-academic purposes.
- translate the legal and official communication/documents in English into Hindi and facilitate faster channels of communication in the organizations where they are working

**List of References:**


- Cronin, Michael. (2003). Translation and globalization. London: Routledge.
- Holmes, James S. (1988): The Name and Nature of Translation Studies. In Holmes, J.S., Translated! Papers on Literary Translation and Translation Studies. Amsterdam.
- Gouadee, D. Translation as a Profession. John Benjamins Publishing 2007.
- Translating official documents by Roberto Mayoral Asenio, Taylor and Franis, 2014, ISBN: 9781317641766, 1317641760.
- Translating Law by Deborah Cao, Multilingual Matters , 2007, ISBN: 9781853599545, 1853599549.
- New Advances in Legal Translation and Interpreting: Editors Detengti , Junfeng Zhao.2023, Springer nature Singapore, ISBN: 9789811994227, 9811994226
- Shastri, Pratima dave 2012, Fundamental Aspects of Transation. PH I Learning , New Delhi
- Rajpal Rajbhasha Prayog Kosh (English-Hindi), (An English-Hindi Dictionary of Official Terms & Usage) by Gopinath Srivastava, 2010, ISBN: 978-81-7028-021-7.
- Glossary of Administrative Terms (English-Hindi), Government of India, 2004

# KURUKSHETRA UNIVERSITY

# KURUKSHETRA

**(Established by the state legislature Act XII of 1964)**
**$A^+$ Grade NAAC Accredited)**

# REVISED

# Scheme of Examination and Syllabus for

# Under-Graduate Programme

# Subject: Chemistry Minor Paper i.e. CC-M1, B-23 CHE-103

# Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020 w.e.f. 2023-24

**DEPARTMENT OF CHEMISTRY, KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**Revised Scheme & Syllabus for Under-Graduate Programme Subject: Chemistry Minor Paper i.e. CC-M1, B-23 CHE-103 Minor Chemistry-I w.e.f. the session 2023-2024**

| FIRST YEAR: SEMESTER-1 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Remarks** | **Course** | **Paper(s)** | **Nomenclature of Paper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **Scheme A & C** | **CC-1 MCC-1 4 credit** | B-23 CHE-101 | Chemistry-I | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 hrs. |
| **Scheme C only** | **MCC-2 4 credit** | B-23 CHE-102 | Physical Chemistry-I | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 hrs. |
| **Scheme A & D** | **CC-M1 2 credit** | B-23 CHE-103 | Minor Chemistry-I | 1 | 1 | 10 | 20 | 30 | 2 hr |
| | | | Practical | 1 | 2 | 05 | 15 | 20 | 2 hrs |
| **Scheme A, C& D** | **MDC-1 3 credits** | B-23 CHE-104 | Introductory Chemistry-I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 1 | 2 | 5 | 20 | 25 | 3 hrs. |
| **Scheme C only** | **CC-M1 4 credit** | From Available CC-I/MCC-I of 4 credits as per NEP | | | | | | | |

| FIRST YEAR: SEMESTER-2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Remarks** | **Course** | **Paper(s)** | **Nomenclature of Paper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **Scheme A & C** | **CC-2 MCC-3 4 credit** | B-23 CHE-201 | Chemistry-II | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 hrs. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Scheme C only** | **DSEC-1 4 credit** | B-23 CHE-202 | Chemistry Skill-I | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 hrs. |
| **Scheme A & D** | **CC-M 2 2 credit** | B-23 CHE-203 | Minor Chemistry-II | 1 | 1 | 10 | 20 | 30 | 3 h |
| | | | Practical | 1 | 2 | 05 | 15 | 20 | 3 hrs |

**CC-M1**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Chemistry | | |
| Semester | I | | |
| Name of the Course | **Minor Chemistry-I** | | |
| Course Code | B23-CHE-103 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 4.0 | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. To understand the basics of Covalent bonding in simple molecules.<br>2. To get the basics of rates of chemical reactions and factors affecting it.<br>3. To learn about the nomenclature, classification and methods of preparation of alkenes.<br>4. To learn about qualitative knowledge of conductors, semiconductors and insulates.<br>5*. Hand on practice in preparation of solutions, compounds, estimation and determination of physical properties of some compounds. | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| Contact Hours | 15 | 30 | 45 |
| **Max. Marks:30 + 20***<br>**Internal Assessment Marks:10 + 05***<br>**End Term Exam Marks:** 20 + 15* | | **Time:02+ 02* hrs** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>**Note:** The examiner is requested to set nine questions in all, selecting two questions from each SECTION and one question (Question No.1 based on entire syllabus will consist of short answer type. All questions carry equal marks. The candidate is required to attempt five questions in all selecting one from each SECTION. Question No.1 is compulsory. Log table and non-programmable calculator is allowed. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | **Covalent Bond**<br>Shapes of simple inorganic molecules and ions based on valence shell electron pair repulsion (VSEPR) theory and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements. | 4 |
| II | **Chemical Kinetics**<br>Concept of reaction rates, factors influencing the rate of reaction, Order and molecularity of a reaction, integrated rate expression for zero and firstorder reactions. | 4 |
| III | **Alkanes (upto 5 carbon atoms)**<br>Alkanes, nomenclature, classification of carbon atoms in alkanes. Isomerism in alkanes, methods of formation: Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids. | 4 |
| IV | **Metallic Bond and semiconductors**<br>Metallic bond – Qualitative idea of Band theory of metallic bond (conductors, semiconductors, insulators). | 3 |
| V | 1. To determine the melting point of given organic compound.<br>2. To prepare a pure sample of dibenzalacetone from benzaldehyde.<br>3. Acid/Base Titration: Determination of strength of HCl using NaOH.<br>4. To determine the refractive index of given liquid.<br>5. To study the process of sublimation of camphor or phthalic acid. | 30 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment: 10 + 05***<br>➢ **Theory**<br>• Class Participation: 3<br>• Seminar/presentation/assignment/quiz/class test etc.: 3<br>• Mid-Term Exam: 4<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 05<br>• Mid-Term Exam: NA | **End Term Examination:**<br><br>**20 + 15*** |
| **Part C-Learning Resources** | |
| **Recommended Books/e-resources/LMS:**<br><br>1. Dhawan S.N.,Organic Chemistry, Vol 1 Pardeep Publication.<br>2. Kapoor, K.L. (2015),**A Textbook of Physical Chemistry**, Vol 1, 6 th Edition, McGrawHillEducation.<br>3. Khosla, B.D.; Garg, V.C.; Gulati, A. (2015),**Senior Practical Physical Chemistry**, R. Chand &Co, New Delhi.<br>4. Lee, J.D.; (2010),**Concise Inorganic Chemistry**, Wiley India. | |

*Applicable for courses having practical component.

# Kurukshetra University Kurukshetra

## Scheme of Examination for Undergraduate subject in Marketing

**According to Curriculum Framework for Undergraduate Subjects as per NEP 2020**

**(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the Session 2023-2024 (in phased manner)**

| Semester | Course Type | Course Code | Nomenclature of Paper | Credits | Credits | Contact Hours | | Internal Marks | End Term Marks | Total Marks | Duration of Exam (Hrs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Theory | Tutorial | T+T | | | | |
| 1 | CC-1 | B23-MKT-101 | Marketing Management-I | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |
| | MDC -1 | B23- MKT -102 | Business Organization | 3 | 2 | 1 | 3 | 25 | 50 | 75 | 3 |
| 2 | CC-2 | B23- MKT -201 | Marketing Management -2 | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |
| | MDC 2 | B23- MKT -202 | Basics of Marketing | 3 | 2 | 1 | 3 | 25 | 50 | 75 | 3 |
| 3 | CC-3 | B23- MKT -301 | Advertising & Sales Promotion | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |
| | MDC 3 | B23- MKT -302 | Personal Selling & Salesmanship | 3 | 2 | 1 | 3 | 25 | 50 | 75 | 3 |
| 4 | CC-4 | B23- MKT -401 | Rural Marketing | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |
| 5 | CC-5 | B23- MKT -501 | Retailing | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |
| 6 | CC-6 | B23- MKT -601 | Supply Chain Management | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Marketing | | |
| Semester | I | | |
| Name of the Course | Marketing Management-I | | |
| Course Code | B23-MKT-101 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/ VAC | CC-1 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. understand the concepts of marketing and marketing environmental.<br>2. know the consumer behavior and market segmentation.<br>3. understand the conceptual framework of need, want, demand and customer value.<br>4. apprehend the recent development in the field of marketing. | | |
| | 5*. | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 3 | 1 | 4 |
| Internal Assessment Marks | 30 | - | 30 |
| End Term Exam Marks | 70 | - | 70 |
| Exam Time | 3 Hrs. | - | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprise of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 14 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Marketing: Concept, nature, scope and importance; Evolution of marketing; Marketing concepts – production, product, selling, societal, etc.; Marketing environment: Concept and importance; Micro environmental factors: Suppliers, intermediaries, customers, competitors, public; Macro environmental factors: Demographic, economic, political, legal, sociocultural, technological. | 14 |

| | | |
|---|---|---|
| II | Consumer behavior: Concept, nature and importance; Consumer buying process; Factors influencing consumer buying behavior; Market segmentation: Concept, importance and bases; Targeting; Positioning: Concept, importance and methods. | 14 |
| III | Need, want and demand: Conceptual framework; Market potential: Concept and methods of measurement; Demand forecasting: Concept and methods; Customer value and customer lifetime value: Concept and application. | 16 |
| IV | Recent developments in marketing: Social marketing; Direct marketing; Green marketing; Network Marketing; Stealth marketing; Online Marketing; Holistic marketing. | 16 |
| V* | ---- | |

**Suggested Evaluation Methods**

| **Internal Assessment:** | | **End Term Exam** |
|---|---|---|
| ➢ **Theory** | 30 Marks | 70 Marks |
| Class Participation | 5 | |
| Seminar/Presentation/Assignment/Quiz/Class Test etc. | 10 | |
| Mid Term Exam | 15 | |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- Grewal, Dhruv and Michael Levy; *Marketing*; Tata McGraw Hill.
- Kumar Arun & Meenakshi N., Marketing Management, Vikas Publishing House Pvt. Ltd., New Delhi. Third Edition
- Michael, J. Etzel, Bruce J. Walker, William J Stanton and Ajay Pandit, Marketing: Concepts and Cases. (Special Indian Edition)., McGraw Hill Education
- Philip Kotler, Principles of Marketing. Pearson Education.
- Ramaswami, V.S. and Namakumari, S.; *Marketing Management*; MacMillan India Ltd.
- Saxena Rajan, Marketing Management, Tata McGraw-Hill Publishing Company Ltd., New Delhi. Fifth Edition.

* Applicable for courses having practical component.

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Marketing | | |
| Semester | II | | |
| Name of the Course | Marketing Management-2 | | |
| Course Code | B23-MKT-201 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/ VAC | CC-2 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. understand the basics of product, product life cycle and new product development.<br>2. know various pricing methods and strategies used by the corporate.<br>3. understand the promotional tools and techniques to make the consumers aware about the product.<br>4. study different distribution channels and role of intermediaries. | | |
| | 5*. | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 3 | 1 | 4 |
| Internal Assessment Marks | 30 | - | 30 |
| End Term Exam Marks | 70 | - | 70 |
| Exam Time | 3 Hrs. | - | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprise of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 14 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Marketing Mix: Conceptual framework – core, actual and augmented product; Product: Concept, importance and classification; Service: Concept, characteristics and difference between product and service; Product Life Cycle; Branding; Packaging and Labelling; New Product Development. | 14 |
| II | Pricing: Concept, significance, objectives; Process of price | 14 |

| | | |
|---|---|---|
| | determination; Pricing strategies: Skimming, penetration, etc; Pricing methods: Cost orienting and market oriented, Cost plus pricing, mark up pricing, target return pricing; Perceived value pricing, differential pricing, psychological pricing, etc.; | |
| III | Promotion: Concept and importance; Promotion mix; Advertising; Publicity; Sales promotion; Personal relation; Online tools for product promotion: Search engines, social media; Factors influencing promotion mix decision. | 16 |
| IV | Distribution: Concept and importance; Distribution and marketing; Marketing channels: Concept and types; Role of intermediaries in distribution channel; Factors influencing decisions on marketing channels. | 16 |
| V* | ---- | |

**Suggested Evaluation Methods**

| **Internal Assessment:** | | **End Term Exam** |
|---|---|---|
| ➢ **Theory** | 30 Marks | 70 Marks |
| Class Participation | 5 | |
| Seminar/Presentation/Assignment/Quiz/Class Test etc. | 10 | |
| Mid Term Exam | 15 | |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- Grewal, Dhruv and Michael Levy; *Marketing*; Tata McGraw Hill.
- Kumar Arun & Meenakshi N., Marketing Management, Vikas Publishing House Pvt. Ltd., New Delhi. Third Edition
- Michael, J. Etzel, Bruce J. Walker, William J Stanton and Ajay Pandit, Marketing: Concepts and Cases. (Special Indian Edition)., McGraw Hill Education
- Philip Kotler, Principles of Marketing. Pearson Education.
- Ramaswami, V.S. and Namakumari, S.; *Marketing Management*; MacMillan India Ltd.
- Saxena Rajan, Marketing Management, Tata McGraw-Hill Publishing Company Ltd., New Delhi. Fifth Edition.

* Applicable for courses having practical component.

| Session2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Marketing | | |
| Semester | I | | |
| Name of the Course | Business Organization | | |
| Course Code | B23-MKT-102 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/ VAC | MDC-I | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. understand the nature of business and related terms.<br>2. know the various forms of Indian Business.<br>3. gain knowledge of company form of organization.<br>4. understand the concept of LPG and MNCs and their role in Indian economy. | | |
| | 5*.- | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 2 | 1 | 3 |
| Internal Assessment Marks | 25 | - | 25 |
| End Term Exam Marks | 50 | - | 50 |
| Exam Time | 3 Hrs. | - | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters:**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprises of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 9 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Concepts of business, industry, commerce, trade, Auxiliaries to trade; Service sector: Concept, components and importance. | 11 |
| II | Forms of business organizations: Sole proprietorship, Joint Hindu Family, Partnership (including LLP) and Company. | 11 |

| | | |
|---|---|---|
| III | Company: Concept, characteristics; Forms of company organization: One person company, Private Limited Company, Public Company, Holding and subsidiary, Co-operative Organization; Factors influencing choice of form of organizations; Internal constituents of business organization: CEO, key managerial personnel, their qualities, role and responsibilities. | 12 |
| IV | Liberalization, Privatization and Globalization, International business: An introduction; MNCs: nature, types, critical analysis. | 11 |
| V*. | --- | |

**Suggested Evaluation Methods**

| **Internal Assessment:** | | **End Term Exam** |
|---|---|---|
| ➢ **Theory** | 25 Marks | 50 Marks |
| Class Participation | 5 | |
| Seminar/Presentation/Assignment/Quiz/Class Test etc. | 7 | |
| Mid Term Exam | 13 | |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**


- Abha Mathur, Business Organization and Management, Taxmann Publications Pvt. Ltd., New Delhi.
- Barry, Jim, Chandler, John, Clark, Heather; Organization and Management, Thompson Learning, New Delhi.
- C. B. Gupta, Business Organization and Management, Sultan Chand and Sons.
- P.C. Tulsian and Vishal Panday, Business Organization and Management, Pearson Publication
- Rao V.S.P., Business Organization and Management, Taxmann Publication.
- Singh, B.P. & Chhabra, T.N., Business Organization and Management, Sun India Publications, New Delhi.


* Applicable for courses having practical component.

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Marketing | | |
| Semester | II | | |
| Name of the Course | Basics of Marketing | | |
| Course Code | B23-MKT-202 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/VAC | MDC-2 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. understand the basic concepts of marketing and assess the marketing environment.<br>2. analyze the consumer behaviour in the present scenario and bases of marketing segmentation.<br>3. discover the new product development and factors affecting the price of a product in the present context.<br>4. understand the promotional and distribution strategies. | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 2 | 1 | 3 |
| Internal Assessment Marks | 25 | - | 25 |
| End Term Exam Marks | 50 | - | 50 |
| Exam Time | 3 Hrs. | - | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprises of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 9 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Marketing: Concept, nature, scope and importance; Evolution of Marketing; Understanding marketing in new perspectives; Marketing environment: Concept, importance; Micro environmental factors: Suppliers, marketing intermediaries, | 11 |

| | | |
|---|---|---|
| | customers, competitors, public; Macro environmental factors: Demographic, economic, natural, technological, politico-legal and socio- cultural. | |
| II | Consumer behaviour**:** Concept, nature and importance, consumer buying decision process, factors Influencing consumer buying behaviour; Market segmentation: Concept, importance and bases; Target market selection; Positioning: Concept, importance and bases. | 11 |
| III | Product: Concept, importance and classification; Branding, Packaging and Labelling; Product life cycle; New product development; Pricing: Concept, significance, price determination, pricing methods, pricing policies and strategies. | 11 |
| IV | Promotion: Nature and importance; Advertising, personal selling, sales promotion and publicity/public relations; Factors affecting promotion mix decisions; Distribution: Concept, importance and types of distribution channels; Factors affecting choice of distribution channel; Retailing; Wholesaling. | 12 |
| **V*** | -- | |

**Suggested Evaluation Methods**

| **Internal Assessment:** | | **End Term Exam** |
|---|---|---|
| ➢ **Theory** | 25 Marks | 50 Marks |
| Class Participation | 5 | |
| Seminar/Presentation/Assignment/Quiz/Class Test etc. | 7 | |
| Mid Term Exam | 13 | |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- Grewal, Dhruv and Michael Levy; *Marketing*; Tata McGraw Hill.
- Kumar Arun & Meenakshi N., Marketing Management, Vikas Publishing House Pvt. Ltd., New Delhi. Third Edition
- Michael, J. Etzel, Bruce J. Walker, William J Stanton and Ajay Pandit, Marketing: Concepts and Cases. (Special Indian Edition)., McGraw Hill Education
- Philip Kotler, Principles of Marketing. Pearson Education.
- Ramaswami, V.S. and Namakumari, S.; *Marketing Management*; MacMillan India Ltd.
- Saxena Rajan, Marketing Management, Tata McGraw-Hill Publishing Company Ltd., New Delhi. Fifth Edition.

* Applicable for courses having practical component.

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Marketing | | |
| Semester | III | | |
| Name of the Course | Personal Selling & Salesmanship | | |
| Course Code | B23-MKT-302 | | |
| Course Type: (CC/MCC/MDC/ CCM/DSEC/VOC/DSE/PC/AEC/ VAC | MDC-3 | | |
| Level of the course (As per Annexure-I) | 200-299 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. understand the conceptual framework and importance of personal selling and salesmanship.<br>2. comprehend the buying motives and process of personal selling.<br>3. understand the concept of sales territory and sales quota management.<br>4. explain various methods and documents used for controlling and evaluating sales force. | | |
| | 5*. | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 2 | 1 | 3 |
| Internal Assessment Marks | 25 | - | 25 |
| End Term Exam Marks | 50 | - | 50 |
| Exam Time | 3 Hrs. | - | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprises of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 9 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Personal selling and salesmanship: Concept, nature, role and importance of selling in marketing, fundamentals of selling, myths in selling, types of sales persons, qualities of successful salesperson, selling as | 12 |

| | | |
|---|---|---|
| | a career; Consumer and industrial markets; Characteristics and implication for the selling function; Types of consumer. | |
| II | Theories of selling: AIDAS, Right set of circumstances theory, Buying formula theory, Behavioural Equation Theory; Personal selling situations; Personal selling process: Prospecting, pre-approaching, approaching, presentation and demonstration, handling objections and closing the sale; Buying motives and its importance in personal selling. | 11 |
| III | Territory and quota management: Need, procedure of setting up sales territories, time management and routing; Sales Quotas: Importance, types of sales quota; Relationship between sales territory and sales quota; Network relationship for sales. | 11 |
| IV | Evaluating the sales force: Need, methods- Qualitative and quantitative; Sales reports and documents: Sales manual, order book, cash memo, tour diary, daily and periodical reports; Ethical aspects of selling. | 11 |
| V* | - | |

**Suggested Evaluation Methods**

| **Internal Assessment:** | | **End Term Exam** |
|---|---|---|
| ➢ **Theory** | 25 Marks | |
| Class Participation | 5 | 50 Marks |
| Seminar/Presentation/Assignment/Quiz/Class Test etc. | 7 | |
| Mid Term Exam | 13 | |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- Futrell, Charles, Sales Management: Behaviour, Practices and Cases, The Dryden Press.
- Johnson, Kurtz and Schueing, Sales Management, McGraw Hill
- Pedesson, Charles A.Wright, Milburn D. and Wetz, Barteon A, Selling: Principles and Methods, Richard, Ervin.
- Rusell, F. A. Beach and Richard H. Buskirk, Selling: Principles and Practices, McGraw Hill
- Spiro, Stanton, and Rich, Management of the Sales force, McGraw Hill.
- Still, Richard R., Edward W. Cundiff and Norman A. P. Govoni, Sales Management: Decision Strategies and Cases, Prentice Hall of India Ltd., New Delhi,

* Applicable for courses having practical component.

# Kurukshetra University Kurukshetra

## Scheme of Examination for Undergraduate subject in Office Management

**According to Curriculum Framework for Undergraduate Subjects as per NEP 2020**

## (Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the Session 2023-2024 (in phased manner)

| Semester | Course Type | Course Code | Nomenclature of Paper | Credits | Credits | Contact Hours | | Internal Marks | End Term Marks | Total Marks | Duration of Exam (Hrs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Theory | Tutorial | T+T | | | | |
| 1 | CC-1 | B23-OMG-101 | Principles of Office Management | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |
| | MDC -1 | B23-OMG-102 | Basics of Accounting | 3 | 2 | 1 | 3 | 25 | 50 | 75 | 3 |
| 2 | CC-2 | B23- OMG-201 | Fundamentals of Computer | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |
| | MDC 2 | B23- OMG-202 | Basics of Finance | 3 | 2 | 1 | 3 | 25 | 50 | 75 | 3 |
| 3 | CC-3 | B23- OMG-301 | Office Communication and Soft Skills | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |
| | MDC 3 | B23- OMG-302 | Office Communication | 3 | 2 | 1 | 3 | 25 | 50 | 75 | 3 |
| 4 | CC-4 | B23- OMG-401 | Basic Accounting for Office | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |
| 5 | CC-5 | B23- OMG-501 | Secretarial Practice | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |
| 6 | CC-6 | B23- OMG-601 | Office Automation | 4 | 3 | 1 | 4 | 30 | 70 | 100 | 3 |

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Office Management | | |
| Semester | I | | |
| Name of the Course | Principles of Office Management | | |
| Course Code | B23-OMG-101 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/ VAC | CC-1 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. understand the concept and functions of office management.<br>2. Plan office systems and routines.<br>3. Manage the office records through filing, indexing, etc.<br>4. apprehend the practices for improving office efficiency. | | |
| | 5*. | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 3 | 1 | 4 |
| Internal Assessment Marks | 30 | - | 30 |
| End Term Exam Marks | 70 | - | 70 |
| Exam Time | 3 Hrs. | - | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprise of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 14 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Office management: Concept, functions importance and Elements; Environment of office; Office Manager: role, functions and qualities; Office Organization: Meaning and principles; Relationship of office with other departments; Centralized vs decentralized office services. | 14 |
| II | Planning office system and routine; Difference flow between office system and routine; System analysis and work flow; Office standards, manuals and rules. Office accommodation: | 14 |

| | | |
|---|---|---|
| | Selection of site; Office layout: Arrangement and adjustment, furniture, allotment of seats, chambers, cabins, etc.; Physical facilities; Office safety and security. | |
| III | Records management: Concept and importance; Filing: classification and arrangement of files; Indexing of files; Methods and advantages; Retention and preservation of records: policies and practices. | 16 |
| IV | Office maintenance; Managing office stationary; Office supervision and control: Need, functions and importance; Motivation, training, stress management and conflict resolution in offices: An overview. | 16 |
| V* | ---- | |

**Suggested Evaluation Methods**

| **Internal Assessment:** | | **End Term Exam** |
|---|---|---|
| ➢ **Theory** | 30 Marks | 70 Marks |
| Class Participation | 5 | |
| Seminar/Presentation/Assignment/Quiz/Class Test etc. | 10 | |
| Mid Term Exam | 15 | |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- Bhatnagar S.K., Front Office Management, Frank Bros and Co. (Publishers) Ltd.
- Chopra R.K., Office Management, Tata McGraw Hill
- Jain J.N. and Singh P.P., Modern Office Management, Deep and Deep Publications
- Pillai R.S.N., Office Management, S. Chand & Sons
- Sahai I.M., Office Management, Sahitya Bhawan Publication, Agra
- Swayam-NPTEL

* Applicable for courses having practical component.

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Office Management | | |
| Semester | I | | |
| Name of the Course | Basics of Accounting | | |
| Course Code | B23-OMG-102 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC / VAC | MDC-1 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. identify and record transactions in the different accounts books.<br>2. prepare different types of cash books.<br>3. prepare trial balance, bank reconciliation statement and rectification entries.<br>4. prepare the final accounts alongwith adjustment entries. | | |
| | 5*.-- | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 2 | 1 | 3 |
| Internal Assessment Marks | 25 | - | 25 |
| End Term Exam Marks | 50 | - | 50 |
| Exam Time | 3 Hrs. | - | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprises of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 9 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Accounting: Concept, need and terms of accounting, book-keeping, accounting and accountancy, accounting principles, accounting cycle; Double entry book keeping system: Recording, posting and balancing. | 11 |

| | | |
|---|---|---|
| II | Cash Book: Single and two columnar, petty cash book (including problems), overview of other subsidiary books. | 11 |
| III | Trial Balance: Concept, preparation, suspense a/c, locating errors and its rectification; Bank reconciliation statement: Need, preparation (problems of favourable and unfavourable balance). | 11 |
| IV | Preparation of final accounts: Manufacturing account, trading account, profit and loss account, balance sheets, adjustment entries. | 12 |

**Suggested Evaluation Methods**

| **Internal Assessment:** | | **End Term Exam** |
|---|---|---|
| ➢ **Theory** | 25 Marks | 50 Marks |
| Class Participation | 5 | |
| Seminar/Presentation/Assignment/Quiz/Class Test etc. | 7 | |
| Mid Term Exam | 13 | |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- J.R. Monga, Basic Financial Accounting, Mayur Paperbacks, Daryaganj, New Delhi
- P.C. Tulsian, Financial Accounting, Tata McGraw Hill, New Delhi
- S.A. Mccary, Mastering Financial Accounting Essentials, The Critical Nuts & Bolts, John Wiley & Sons Inc., New Jersey.
- S.N. Maheshwari, Financial Accounting, Vikas Publications, New Delhi

* Applicable for courses having practical component.

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Office Management | | |
| Semester | II | | |
| Name of the Course | Fundamentals of Computer | | |
| Course Code | B23-OMG-201 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/ VAC | CC-2 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. know the use of computers in office.<br>2. understand the types of software used in office.<br>3. work on word processor software.<br>4. use IT applications in the office management.<br>5*. | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 3 | 1 | 4 |
| Internal Assessment Marks | 30 | - | 30 |
| End Term Exam Marks | 70 | - | 70 |
| Exam Time | 3 Hrs. | - | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprise of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 14 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Computer application in office: Need and importance; Components of computers: Software and Hardware: Input and output devices used in offices. | 14 |
| II | Software: Concept and types: Operating System – role, functions and types; Other systems software; Application software: Word processor, spread sheet, presentation and database management. | 14 |
| III | Word Processor: Concept and functions; MS Word; Creation editing and saving of documents; Formatting of text, tables in documents; Spelling and grammar check; | 16 |

| | | |
|---|---|---|
| | Inserting images and graph in documents; Page layout and margins; Printing of documents. An overview of Libre office and Open office. | |
| IV | MS Power point: Overview and applications; IT applications in office: communication – email, file transfer, EDI; Online reporting; Cloud based storage of records. | 16 |
| V* | ---- | |

**Suggested Evaluation Methods**

| **Internal Assessment:** | | **End Term Exam** |
|---|---|---|
| ➢ **Theory** | 30 Marks | 70 Marks |
| Class Participation | 5 | |
| Seminar/Presentation/Assignment/Quiz/Class Test etc. | 10 | |
| Mid Term Exam | 15 | |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- Balagurusamy E, Fundamentals of Computer, Mc Graw Hills
- Jain Hem Chand, Computer Application in Business, Taxmann's
- Parameswaran R., Computer Applications in Business, S. Chand
- Sinha P.K., Computer Fundamentals, BPB Publications
- Srivastava Anant Kumar, Information Technology and its Application in Business, Sahitya Bhawan Publication, Agra.
- Swayam-NPTEL

* Applicable for courses having practical component.

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Office Management | | |
| Semester | II | | |
| Name of the Course | Basics of Finance | | |
| Course Code | B23-OMG-202 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/ VAC | MDC-2 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. understand essential elements in modern finance.<br>2. have an overview of the basics of Indian financial system.<br>3. gain knowledge about the basics of corporate finance.<br>4. understand the financial statements and to compute basic financial ratios. | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 02 | 01 | 03 |
| Internal Assessment Marks | 25 | - | 25 |
| End Term Exam Marks | 50 | - | 50 |
| Exam Time | 3 Hrs. | - | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprises of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 9 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Finance: Origin, characteristics, types and principles; Basic finance and accounting terms; relationship of finance with economics and accounting. | 12 |
| II | Financial system: Financial instruments, financial markets, regulators, intermediaries and services; Banking System: Types, functions, regulation; NBFCs. | 11 |
| III | Corporate finance: Meaning, objectives, functions, decisions, limitations and approaches; Sources of finance; Time value of money; Simple and compound interest. | 11 |

| | | |
|---|---|---|
| IV | Basics of financial statements, analysis of financial statements; Computing basic financial ratios. | 11 |

**Suggested Evaluation Methods**

| **Internal Assessment:** | | **End Term Exam** |
|---|---|---|
| ➢ **Theory** | 25 Marks | 50 Marks |
| Class Participation | 5 | |
| Seminar/Presentation/Assignment/Quiz/Class Test etc. | 7 | |
| Mid Term Exam | 13 | |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- Erik Banks, Finance: The Basics, Routledge.
- M.Y. Khan, Indian Financial System, McGraw Hill
- Pamela Peterson Drake, Frank J. Fabozzi: The Basics of Finance An Introduction to Financial Markets, Business Finance, and Portfolio Management, Wiley.
- S.N. Maheshwari, Elements of Financial Management, Sultan Chand & Sons.
- Sharma & Gupta, Financial Management, Kalyani Publishers.

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Commerce | | |
| Semester | I | | |
| Name of the Course | Financial Accounting | | |
| Course Code | B23-COM-101 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/ VAC | CC-1 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. develop the understanding of theoretical framework of financial accounting and accounting standards.<br>2. prepare the financial statements of companies.<br>3. understand and prepare the accounts for the non-profit organizations and consignment accounts.<br>4. prepare the branch accounts and knowing the accounting treatment in hire purchase & instalment payment accounts. | | |
| | 5*. | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 3 | 1 | 4 |
| Internal Assessment Marks | 30 | - | 30 |
| End Term Exam Marks | 70 | - | 70 |
| Exam Time | 3 Hrs. | - | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprise of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 14 marks each, having two questions from each unit. About 40% questions should be numerical type.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Financial accounting: Concept, objectives & scope; Accounting as an information system; Accounting principles: Concepts and conventions; Double entry system; A brief overview of | 14 |

| | | |
|---|---|---|
| | accounting standards in India; Journal, Ledger & trial balance. | |
| II | Capital and revenue: Concept and classification of income; Expenditure; Receipts; Provisions & reserves. Final Accounts: Trading & Profit and loss account and balance sheet with adjustments. | 14 |
| III | Accounting for non-profit organizations; Consignment accounts: accounting records; Normal and abnormal loss; Valuation of unsold stock. | 16 |
| IV | Branch accounts: dependent branch, debtor's system, stock and debtor system; Wholesale branch, Final accounts; Hire purchase and instalment payment system: basic concepts, difference and accounting treatment. | 16 |
| V* | ---- | |

**Suggested Evaluation Methods**

| **Internal Assessment:** | **End Term Exam** |
|---|---|
| ➢ **Theory**<br>Class Participation<br>Seminar/Presentation/Assignment/Quiz/Class Test etc.<br>Mid Term Exam | |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- Gupta R. L. and Radhaswamy, M., Financial Accounting, Sultan Chand and Sons, New Delhi.
- Hanif & Mukherjee., 2016. Financial Accounting. Tata McGraw Hill.
- Lal Jawahar, Seema Srivastava & Shivani Abrol, Financial Accounting Text and Problems, Himalaya Publishing House, New Delhi.
- Maheswari S. N. and Maheswari S. K.: Financial Accounting, Vikas Publishing House, Noida.
- Sehgal Ashok & Sehgal Deepak, Fundamentals of Financial Accounting, Taxmann, New Delhi.

* Applicable for courses having practical component.

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Commerce | | |
| Semester | I | | |
| Name of the Course | Personal Finance | | |
| Course Code | B23-COM-105 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/ VAC | MDC-1 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. understand the basics of personal finance and personal financial planning.<br>2. gain knowledge about investing in stock market.<br>3. do planning for other investment avenues.<br>4. understand the role of regulatory environment in managing personal finance and retirement planning. | | |
| | 5* | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 02 | 01 | 03 |
| Internal Assessment Marks | 25 | - | 25 |
| End Term Exam Marks | 50 | - | 50 |
| Exam Time | 3 Hrs. | | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprises of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 9 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Personal finance: Concept, need, principles and scope; Financial objectives; Personal financial planning: Process, factors affecting; Financial planner: Role and functions; Sources of finance. | 11 |
| II | Basics of investment; Investment avenues and strategies; Shares and debentures: Concept and types; Mutual Funds: Concept, types, asset | 12 |

| | | |
|---|---|---|
| | management companies, identifying mutual fund for investment; Investing in stock markets: Identifying stocks, holding, day trading, hedging instruments, etc. | |
| III | Other investment Avenues: Gold bonds, sovereign bonds, tax saving instruments, PPF, Provident Fund, etc.; Tax treatment of investment; Likely causes of cheating and fraud in investment. | 11 |
| IV | Institutional framework for investing: An overview of SEBI, IRDA, RERA, AMFI, bank ombudsman; Retirement planning: Pension plans, NPS. | 11 |
| V* | - | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>Class Participation<br>Seminar/Presentation/Assignment/Quiz/Class Test etc.<br>Mid Term Exam | **End Term Exam** |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- Arthur J. Keown: Personal Finance, Pearson India.
- Halan, Monika, Lets Talk Money: You've Worked Hard for It, Now Make It Work for You, July 2018, Harper Business.
- Jack R. Kapoor, Les R. Dlabay, Robert J. Hughes, Melissa Hart: Personal Finance, Tata McGraw Hill India.
- Lewis Altfest: Personal Financial Planning, Tata McGraw Hill.
- Madura Jeff: Personal Finance, Pearson India.
- Sinha. Madhu, Financial Planning: A Ready Reckoner July 2017 McGraw Hill.

* Applicable for courses having practical component.

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Commerce | | |
| Semester | III | | |
| Name of the Course | Business Economics | | |
| Course Code | B23-COM-304 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/ VAC | CC-M3 | | |
| Level of the course (As per Annexure-I) | 200-299 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. understand price & output determination under different market structures.<br>2. understand behaviour of firms & their stakeholders with many products and multiple objectives.<br>3. develop the capability to analyse macro-economic environment.<br>4. take decisions according to state economic policies. | | |
| | 5* | | |
| | **Theory** | **Tutorial** | **Total** |
| Credits | 3 | 1 | 4 |
| Internal Assessment Marks | 30 | - | 30 |
| End Term Exam Marks | 70 | - | 70 |
| Exam Time | 3 Hrs. | - | 3 Hrs. |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprises of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 14 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Nature and scope of business economics, Importance of economics in business decisions; Basic Economic Concepts; Marginal analysis; Nature of demand function: law of demand, shifts in demand curve, factors influencing demand; Elasticity of demand: price, income and cross; Consumer's equilibrium: Cardinal Utility | 14 |

| | | |
|---|---|---|
| | Approach, Ordinal Utility approach. | |
| II | Production function: short and long run - law of variable proportions; Return to factor; Law of returns to scale; economies and diseconomies of scale; Equilibrium of firm under perfect competition; monopoly - price discrimination, Price and output determination under monopolistic competition; Decisions under monopolistic competition. | 16 |
| III | Non-collusive oligopoly models- Cournot and Kinked Demand Curve; Collusive oligopoly models – Cartels, price leaderships; Employment theory, classical employment theory; Keynesian theory of employment; Money definition and its functions. | 15 |
| IV | Macro Economics: concept, nature and scope; Circular flow of income (four core sectors); National income concepts (an overview) – GNP, GDP, NNP, NDP; Inflation: types and control; Money supply (monetary aggregates); Fiscal policy; Monetary policy; Business cycles and their control. | 15 |
| V* | - | |

**Suggested Evaluation Methods**

| **Internal Assessment:** | **End Term Exam** |
|---|---|
| ➢ **Theory**<br>Class Participation<br>Seminar/Presentation/Assignment/Quiz/Class Test etc.<br>Mid Term Exam | |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- Ahuja, H.L., Macro Economics, S. Chand Publications, New Delhi.
- Dwivedi, D.N., Macro Economics, Tata McGraw Hill, New Delhi.
- G.S. Gupta : Managerial Economics McGraw Hill Education; 2ndedition, 2017
- Jhinghan M.L.: Advanced Economic Theory. Vrinda Publications, New Delhi.
- Koutsoyiannis A.: Modern Microeconomics; Macmillan New Delhi.
- Paul, S., Gupta, G. and Mote, V., Managerial Economics, Tata McGraw Hill

* Applicable for courses having practical component.

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**(Established by the State Legislative Act XII of 1956)**

**("A+" Grade, NAAC Accredited)**

Scheme of Examination of M.Sc. Economics (Hons.) Five-year Integrated Programme Semester 7st to Semester 8th w.e.f. Session 2023 - 24, Under Choice Based Credit System/LOCF in phased manner for the regular students of Institute of Integrated and Honors Studies, K.U. Kurukshetra..

| Semester | Course Code | | Course Name | Credit | Teaching Hour per week | Scheme of Examination | | | Exam Duration Hrs. |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Internal Assessment | Theory | Total Marks | |
| 7th Sem. | CC-15 | IN-ECX-701 | Advanced Microeconomics-1 | 4 | 4 | 20 | 80 | 100 | 3 |
| | | IN-ECX-702 | Advanced Microeconomics-(P) | 2 | 2 | 10 | 40 | 50 | 3 |
| | CC-16 | IN-ECX-703 | Advanced Macroeconomics-1 | 4 | 4 | 20 | 80 | 100 | 3 |
| | | IN-ECX-704 | Advanced Macroeconomics-1 (P) | 2 | 2 | 10 | 40 | 50 | 3 |
| | CC-17 | IN-ECX-705 | Advanced Public Economics-1 | 4 | 4 | 20 | 80 | 100 | 3 |
| | | IN-ECX-706 | Advanced Public Economics-1 (P) | 2 | 2 | 10 | 40 | 50 | 3 |
| | DSE-5 | IN-ECX-707 | Mathematical Economics-1 | 4 | 4 | 20 | 80 | 100 | 3 |
| | | IN-ECX-708 | Mathematical Economics-1 (P) | 2 | 2 | 10 | 40 | 50 | 3 |
| | Or | | | | | | | | |
| | DSE-5 | IN-ECX-709 | Computer applications for Economists-1 | 4 | 4 | 20 | 80 | 100 | 3 |
| | | IN-ECX-710 | Computer Applications for Economists-1(P) | 2 | 2 | 10 | 40 | 50 | 3 |
| | | | **Total** | **24** | **24** | **120** | **480** | **600** | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 8th Sem. | CC-18 | IN-ECX-801 | Advanced Microeconomics-II | 4 | 4 | 20 | 80 | 100 | 3 |
| | | IN-ECX-802 | Advanced Microeconomics-II(P) | 2 | 2 | 10 | 40 | 50 | 3 |
| | CC-19 | IN-ECX-803 | Advanced Macroeconomics-II | 4 | 4 | 20 | 80 | 100 | 3 |
| | | IN-ECX-804 | Advanced Macroeconomics-II (P) | 2 | 2 | 10 | 40 | 50 | 3 |
| | CC-20 | IN-ECX-805 | Advanced Public Economics-II | 4 | 4 | 20 | 80 | 100 | 3 |
| | | IN-ECX-806 | Advanced Public Economics-II(P) | 2 | 2 | 10 | 40 | 50 | 3 |
| | OESS-1 | IN-ECX-807 | Export-Import Procedures | 2 | 2 | 10 | 40 | 50 | 3 |
| | | | **Total** | **20** | **20** | **100** | **400** | **500** | |

*Workload=1 Hour of teaching/2 hours of practical work=25 marks

*GE: Generic Elective@ 6 credits. Available in English only(As per respective Department)*CC: *Core courses are fourteen @ 6 credits per semester.

*OESS- Open Elective Subject Specific

*SEC: Skill Enhancement Course is four. @ 2 credits per semester, (As per respective Department)

*DSE: Discipline Specific Elective are four @ 6 credits per semester.

*General elective may be other than economics.

**MASTER OF SCIENCE ECONOMICS (Honors)**
**5-year integrated course**

**PROGRAMME OUTCOMES (POs) for MSc honors course of Economics**

1- **To develop skills in graduate students so that they are able to acquire theoretical and practical knowledge about economics, economy, economic behavior, economic policies and economic institutions and economic problems.**
2- **To inculcate ability in students for critical thinking, lateral thinking about economic phenomena, problems and policies so as to create professional potential in them**
3- **To create awareness on ethical issues, good business practices, and ecology economics interface**
4- **To development ability in youth for understanding basic economic rationality and effective communication skills**
5- **To prepare youth for career in teaching, industry, government organizations and self-entrepreneurship**
6- **To make students aware of natural resources, sustainable use and environment**
7- **To provide learning experience in students that instills deep interest in economic science for the benefit of society.**

**PROGRAMME SPECIFIC OUTCOMES (PSOs) for M.Sc course in Economics (Honors)**

**PSO1: demonstrate the knowledge and understanding of economic science i.e. vital processes of economy, consumer and producer behavior at micro level and macro level**

**PSO2: critically think and correlate the economics knowledge with decision-making with regard to economic planning and economic policies, understanding of conflicts, tradeoffs, and welfare implications of economic measures to improve the quality of life in person as well as of community.**

**PSO3: demonstrate an understanding of the principles, methods of economic analysis in static and dynamic terms, analysis of economic data**

**PSO4: concise and meaningful writing and reporting, effective presentation skills, and ability to work productively in a group with co-operation**

**Master of Science Economics (Honors)5-year integrated**
**Semester-VII**
**Advanced Microeconomics-I**
**IN-ECX-701**

**External marks:80**
**Internal Marks:20**
**Total marks:100**
**Credits:4**
**Time: 3 hours**

**Note:**

(i) Nine Questions will be set in all and students will be required to attempt 5 questions.

(ii) Question No. 1 will be compulsory and will consist of 8 short answer type questions of 2 marks spread over the entire syllabus (2*8=16 marks).

(iii) For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (16 marks each)

| Content | Learning objectives |
|---|---|
| **UNIT-I**<br>**Theory of Demand and Consumer Behavior**<br>Cardinal utility theory, Ordinal utility theory: Indifference curve approach and its applications (The leisure-income trade-off, Evaluation of alternative government policies, IC and theory of exchange); Slutsky and Hicks decomposition; Revealed Preference Theory; The Consumer's Surplus (Marshall and Hicks) and its applications. | After going through this unit, Student will be able to:<br>• Students should be able to apply basic microeconomic theories to solve economic problems<br>• Student should be able to formulate economic problems and logically derive conclusions and results based on assumptions made using the tools and techniques learnt. |
| **UNIT-2**<br>**Theory of Production and Costs**<br>Laws of Production: short run and long run (variable proportions and returns to scale with the help of iso-quants). Concept of cost, derivation of short and long run cost curves. Optimum input combination Simple case of a multiproduct firm. Technical progress and production function – Hick's classification. Elasticity of substitution. Properties of Cobb-Douglas and CES production function. | After going through this unit, Student will be able to:<br>• Understand the core principles of production and costs so that they are able to comprehend real world problems along with the ability to think critically and analyze economic problems. |
| **UNIT-3**<br>**Non-Collusive Models**<br>Cournot; Bertrand; Stackelberg; Chamberlin; Kinked-demand curve.<br><br>**Collusive Models**<br>Cartels (Joint profit maximization and market sharing); Price leadership models (Low cost firm, | After going through this unit, Student will be able to:<br>• understand the oligopolistic market structure;<br>• appreciate the role of interdependence among the producers in deciding the output and price;<br>• examine the important models developed for analyzing oligopolistic behavior. |

| | |
|---|---|
| Dominant firm and Barometric price leader). | |
| **UNIT-4**<br>**Theory of Equilibrium**<br>Partial and General Equilibrium: Cobweb Model; Walrasian General Equilibrium Model, Existence, uniqueness and stability of General Equilibrium. | After going through this unit, Students will be able to:<br>• Differentiate between partial equilibrium and general equilibrium approach<br>• Discuss Walrasian approach to general equilibrium |

**Advanced Microeconomics-(P)**
**IN-ECX-702**

**External marks:40**
**Internal marks:10**
**Total marks:50**
**Credits:2**
**Time:3 hours**

| |
|---|
| **Graphic presentation**<br><br>a) Indifference curve and its Applications, Slutsky and Hicks decomposition.<br>b) Law of Production and Production Function.<br>c) Oligopoly: Reaction curves, Kinked demand curve, Cartels.<br>d) Cobweb model of partial equilibrium. |

**OVERVIEW OF OUTCOMES (IN-ECO-701 and IN-ECO-702)**
**Advanced Microeconomics I**

**After the successful completion of the course, the students will be able to**
Course Objective:

| | |
|---|---|
| **IN-ECX-701 and 2.1** | Students should be able to apply basic microeconomic theories to solve economic problems. |
| **IN-ECX-701 and 2.2** | Students should be able to understand the concept of production function as the relation between output and inputs. |
| **IN-ECX-701 and 2.3** | Students should be able to apply the relevant optimization techniques for analysis of microeconomic Behaviour of consumer, producer and firm. Simultaneously Understanding the implications and ethical as well as value part of it. |
| **IN-ECX-701 and 2.4** | Students should be able to Differentiate between partial equilibrium and general equilibrium approach. |

**Mapping Matrix of Course Applied Microeconomics Theory and Practical**
Table: CO-PO Matrix for the Course, IN-ECO-701 and 702

| CO# | PO 1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ECX-701 and 2.1** | | | | | | | | | | | |
| **ECX-701 and 2.1** | | | | | | | | | | | |
| **ECX-701 and 2.1** | | | | | | | | | | | |
| **ECX-701 and 2.1** | | | | | | | | | | | |
| **Average** | | | | | | | | | | | |

**Suggested Reading List**


1. Archibald, G.C. (Ed.) (1971). *Theory of the Firm*. Penguin, Harmondsworth.
2. Baumol, W.J. (1982). *Economic Theory and Operations Analysis*. Prentice Hall of India, New Delhi.
3. Bronfenbrenner, M. (1979), *Income Distribution Theory*, Macmillan, London.
4. Da Costa, G.C. (1980). *Production, Prices and Distribution*. Tata McGraw Hill, New Delhi.
5. Green, H.A.G. (1971). *Consumer Theory* .Penguin, Harmondsworth.
6. Healthfields and Wibe (1987). *An Introduction to Cost and Production Functions*. Macmillan, London.
7. Henderson & Quandt (1980). *Microeconomic Theory: A Mathematical Approach.* McGraw Hill, New Delhi.
8. Hirshleifer, J. & Glazer, A. (1997). *Price Theory and Applications*. Prentice Hall of India, New Delhi.
9. Hugh Gravelle, Ray Rees (2004) "*Microeconomics, 3rd Edition*" – Pearson Education Limited.
10. Jehle, G. and Reny, P. (2011) *Advanced Microeconomic Theory*. 3rd Edition, Financial Times Prentice Hall, London.
11. Koutsoyiannis, A. (1979). *Modern Microeconomics (2nd Edition).* Macmillan Press, London.
12. Mas-Colell, A., Whinston, M.D., and Green J. (1995): *Microeconomic theory*, Oxford University Press
13. Pindyck R. & Rubinfeld, D. (2018). *Microeconomics (9th Edition)*. Pearson.
14. Salvatore, D. (2009). *Microeconomics-Theory and Applications.* Oxford University Press.
15. Varian, H.R. (2019): *Microeconomic Analysis, third edition*, first Indian edition, W W Norton & Company; 3rd edition

# Master of Science Economics (Honors) 5-Years Integrated
## Advanced Macro Economics-I

**Semester-VII**

**IN-ECX-703**

**External Marks: 80**

**Internal Marks: 20**

**Total Marks: 100**

**Credits: 4**

**Time: 3hours**

## Note:

(i) Nine Questions will be set in all and students will be required to attempt 5 questions.

(ii) Question No. 1 will be compulsory and will consist of PART-A & B, comprising 10 and 6 marks respectively. All Qs of PART-A and 3 Qs out of 6from part-B are to be attempted.

(iii) For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (16 marks each).

| Content | Learning objectives |
|---|---|
| **UNIT-I**<br>**(i-a)**<br>**National Income and Accounts:** Concept of national income, Circular Flow of Income (Two Sector, Three Sector & Four sector economy); Social Accounts and its uses<br>**(i-b)**<br>**Theory of National Income determination:** Classical theory of output & employment theory and Keynesian income determination Model. | **(i-a)**<br>Objective is to introduce the students about macroeconomics, nature of economic processes as a circular flow, Social Accounts<br>**(i-b)**<br>Objective is to acquaint the students with approaches relating to determination of Income and employment and get exposure about Keynes' model. |
| **UNIT-2**<br>**(ii-a)**<br>**Consumption Function:**<br>Keynes Consumption and saving functions, Psychological law of consumption<br>**(ii-b)**<br>**Consumption Puzzles:**<br>Absolute Income, Relative Income, Life Cycle and Permanent Income Hypotheses. | **(i-a)**<br>Objective is to introduce the students about macroeconomics, nature of economic processes as a circular flow, Social Accounts<br>**(i-b)**<br>Objective is to acquaint the students with approaches relating to determination of Income and employment and get exposure about Keynes' model. |
| **UNIT-3**<br>**(iii-a)** | **(iii-a)**<br>Aims at pupils 'understanding of |

| | |
|---|---|
| **Investment Function:**<br>Types of Investment, Methods of Investment Decisions ( The Net Present Value Method, Marginal Efficiency of Capital Method &Marginal efficiency of Investment)<br>**(iii-b)**<br>**Income & Investment:**<br>The Accelerator Theory of Investment, Jorgenson's Model, Tobin's Q Theory of Investment | macroeconomic aggregate of investment and factors of Investment.<br><br>**(iii-b)**<br>Objective is to make students learn about decision to Invest, and Income generation process, and applicability of Accelerator Theory of Investment. |
| **UNIT-4**<br>**(iv-a)**<br>**Money supply**: Determinants of Money Supply, High-Powered Money and Money Multiplier; RBI measures of Monetary Aggregates.<br>**(iv-b)**<br>**Demand For Money**:Classical and Keynesian approach to demand for money; Post–Keynesian approaches to demand for money (Baumol and Tobin; Friedman's Restatement of Quantity Theory of Money. | **(iv-a)**<br>Aims at introducing the students about money supply, its determinants and components of money supply.<br><br>**(iv-b)**<br>Aims at introducing the students about demand for money, different approaches to demand for money. |

## Master of Science Economics (Honors) 5-Years Integrated
## Advanced Macro Economics-I (P)

**Semester-VII**

**Practical Presentation (Written/Oral)**

**IN-ECX-704**

**ExternalMarks: 40**

**InternalMarks: 10**

**TotalMarks: 50**

**Credits: 2**

**Time: 3hours**

**Presentation (Written& Oral)**

a) Circular Flow of Income (Two Sector, Three Sector & Four sector economy)
b) Absolute Income, Relative Income, Life Cycle and Permanent Income Hypotheses.
c) Accelerator Theory of Investment
d) Jorgenson's Model and
e) RBI measures of Monetary Aggregates

**OVERVIEW OF OUTCOMES ( IN-ECX-703 and IN-ECX-704)**

# Advanced Macro Economics- I

**After the successful completion of the course, the students will be able to**

**Course Objective:**

| | |
|---|---|
| **IN-ECX-703 and 3.1** | To apprise the students about functioning of an economy, and behavior of macroeconomic aggregates. To give notion about how an economy achieves equilibrium level of employment. |
| **IN-ECX-703 and 3.2** | To elaborate the constituents of Aggregate Demand Consumption& Investment, and to apprise the students about consumption income relationship and Investment income relationship in the long run. |
| **IN-ECX-703 and 3.3** | To give knowledge to students describing the nature and structure of demand for money and supply of money. Displaying the role they play in monetary policy of a nation. |
| **IN-ECX-703 and 3.4** | To give knowledge to the students about demand for money and different approaches of demand for money. |

## Mapping Matrix of Course Advanced Macro Economics-I (Theory and Practical)

## Table: CO-PO Matrix for the Course, IN-ECO-703 and 704

| CO# | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **IN-ECX-703 and 3.1** | | | | | | | | | | | |
| **IN-ECX-703 and 3.2** | | | | | | | | | | | |
| **IN-ECX-703 and 3.3** | | | | | | | | | | | |
| **IN-ECX-703 and 3.4** | | | | | | | | | | | |
| **Average** | | | | | | | | | | | |

## Suggested Reading List


1) Ackley,G.(1978),Macroeconomics:TheoryandPolicy,Macmillan,NewYork.
2) BernankeandAbel:Macroeconomics,4thEdition
3) Black house, R.andA.Salansi (Eds.)(2000), Macroeconomics and

the Real World(2Vols.),Oxford University Press, London.
4) Blanchard: Macroeconomics (Pearson Education),4thEdition.
5) Branson,W.A.(1989),Macroeconomic Theory and Policy,(3rd Edition),Harper and Row, New York.
6) Dernburg,T.F. and D.M.Mc Dougall, Macroeconomics, McGraw Hill International Book Company.
7) Dornbusch, FisherandStartz:Macroeconomics(TataMcGraw-Hill),9thEdition.
8) Dornbusch,R.andF.Stanley(1999),Macroeconomics,IrwrinMcGrawHill,Inc.New
9) York,7thEdition.
10) Edward Shapiro: Macroeconomic Analysis.
11) Frisch,H.(1983),Theories of Inflation, Cambridge University Press, Cambridge.
12) Gardner Ackley: Macroeconomic Theory
13) Heijdra,B.J.andV.P.Fredericck (2001), ,Oxford University Press, Delhi.
14) J ha, R.(1991), Contemporary Macroeconomic Theory and Policy,

Wiley Eastern Ltd., New Delhi.
15) KarlE.Case,RayC.Fair :Principles of Macroeconomics, Publisher: Prentice Hall
16) Lucas, R.(1981), Studies in Business Cycle Theory, MIT Press, Cambridge, Masscechusetts.
17) Mankiw N.G: Macroeconomics (Worth Publishers),5thEdition,
18) Mankiw,N.Greogory (2000),Macroeconomics Macmillan worth Publishers4thEdition.
19) Mankiw,N.G.andD.Romer(Eds.)(1991),NewKeynesianEconomics,(2Vols.),MITPress,Cambridge.
20) Rana &Verma: Macro-economic Analysis.
21) Romer,D.L.(1996),Advanced Macroeconomics, McGraw Hill Company Ltd., NewYork.
22) RugglesR.and N.Ruggles(1956),NationalIncomeAccountsandIncomeAnalysisMcGraw Hill, Newyork.
23) Samuelson P.A, and Nordham,W.D (1998):Economics, Tata-McGraw Hill, New Delhi.
24) Sheffirin,S.M. (1996),Rational Expectations, Cambridge University Press, Cambridge.
25) Taylor,L.(1983),StructuralistMacroeconomics,BasicBooks,NewLongman .Turnovsky,S.J. (1977),Macroeconomic Analysis and Stabilization Policy, Cambridge University Press, Cambridge.
26) Veniers,Y.P. and F.D.Sebold,(1977) Macroeconomics; Models and Policy John Wiley andInc, USA.

**Master of Science Economics (Honors)5-year integrated**
**Semester-VII**
**Advanced Public Economics-1**
**IN-ECX-705**

**External marks:80**
**Internal Marks:20**
**Total marks:100**
**Credits:4**
**Time: 3 hours**

**Note:**

(iv) Nine Questions will be set in all and students will be required to attempt 5 questions.

(v) Question No. 1 will be compulsory and will consist of 8 short answer type questions of 2 marks spread over the entire syllabus (2*8=16 marks).

(vi) For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (16 marks each)

| Content | Learning objectives |
|---|---|
| **UNIT-I**<br>**(i-a)**<br>Economic Rationale of Mixed Economy; Role of Government in a State; Efficiency, market and Governments; Market Failure and the rationale for Government Intervention;<br><br>**(i-b)**<br>Asymmetric Information and market failure; The problem of Externalities and their Internalization | After studying this Unit, Students shall be able to<br>**(i-a)** Understand the concept of Mixed economy and Understand the role performed by the government in a mixed economy system.<br><br>**(i-b)** Know the role played by the government in correcting market failures and the functions performed by a government in an economy. |
| **UNIT-2**<br>**(ii-a)**<br>Concepts, characteristics and types of public goods; Efficient provision of Public goods- Samuelson Model.<br><br>**(ii-b)** | After studying this Unit, Students shall be able to<br>**(ii-a)** Understand the concept of public goods and private goods. Discuss the theoretical models (Samuelson's Pure Theory of Public Expenditure)<br><br>**(ii-b)** Discuss the theoretical models (Wagner Hypothesis, Wiseman-Peacock hypothesis) in |

| | |
|---|---|
| Wagner Hypothesis, Wiseman-Peacock hypothesis; Clarke-mechanism, Theory of Club Goods | the context of public goods. |
| **UNIT-3**<br>**(iii-a)**<br>Efficiency and equity principles of taxation; Incentive effects of taxation on labour supply; Supply of savings and risk taking; Taxation and Investment; Other distorting effects of tax system;<br><br>**(iii-b)**<br>Tax system: partial and general equilibrium analysis. | After studying this Unit, Students shall be able to:<br><br>**(iii-a)** Understand the concept of equity and the concept of efficiency<br><br>**(iii-b)** Objective is to acquaint the students with partial and general equilibrium analysis |
| **UNIT-4**<br>**(iv-a)**<br>Normative analysis of taxation-Income vs excise tax; Optimal tax mix, optimal Income tax;<br><br>**(iv-b)**<br>Excess burden of tax, and its measurement; Equity considerations in the choice of a tax system; Indian taxation system and GST. | After studying this Unit, Students shall be able to<br>**(iv-a)** Learn the theory of optimal taxation. And analyze the factors affecting the optimal tax structure in an economy.<br><br>**(iv-b)** Know the Indian tax system(GST). |

**Advanced Public Economics – (P)**
**IN-ECX-706**

**External marks:40**
**Internal marks:10**
**Total marks:50**
**Credits:2**
**Time:3 hours**

| |
|---|
| **Presentation (Written& Oral)**<br><br>f) Asymmetric Information and market failure<br>g) Characteristics and types of public goods<br>h) Incentive effects of taxation on labour supply |

| |
|---|
| i) Goods and Services Tax (GST). |

**OVERVIEW OF OUTCOMES (IN-ECO-705 and IN-ECO-706)**

## Advanced Public Economics I

**After the successful completion of the course, the students will be able to**

Course Objective:

| | |
|---|---|
| **IN-ECX-705 and 6.1** | Understand, explain and apply the concept of efficiency along with various solutions of market failure. |
| **IN-ECX-705 and 6.2** | Comprehend and present the efficiency and welfare distribution aspects in context of public goods. |
| **IN-ECX-705 and 6.3** | Understand the economic implications of various taxes along with their critical analysis thereby attain in-depth knowledge of theories and postulates based on taxation. |
| **IN-ECX-705 and 6.4** | Development of critical thinking regarding normative aspects of taxation and thus become able to design an efficient and equitable taxation system. |

**Mapping Matrix of Course Advanced Public Economics Theory and Practical**

Table: CO-PO Matrix for the Course, IN-ECO-705 and 706

| CO# | PO 1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **IN-ECX-705 and 6.1** | | | | | | | | | | | |
| **IN-ECX-705 and 6.2** | | | | | | | | | | | |
| **IN-ECX-705 and 6.3** | | | | | | | | | | | |
| **IN-ECX-705 and 6.4** | | | | | | | | | | | |
| **Average** | | | | | | | | | | | |

**Readings:**


1. Bagchi, Amaresh (Ed.). (2005). Readings in Public Finance. Oxford University Press.
2. Boadway, Robin (1984). Public Sector Economics. Cambridge, Winthrop Publications.
3. *Economic Survey*, Government of India (Latest).
4. H. Rosen, T. Gayer: *Public Finance*, 9th ed., McGraw-Hill/Irwin, 2009.
5. Harvey Rosen, *Public Finance*, McGraw Hill Publications, 7th edition, 2005.

6. J. Hindriks, G. Myles: *Intermediate Public Economics*, MIT Press, 2006.
7. John Cullis and Philip Jones, *Public Finance and Public Choice*, Oxford University Press, 1st edition, 1998.
8. Joseph E. Stiglitz, *Economics of the Public Sector,* W.W. Norton & Company, 3rd edition, 2000.
9. Kaushik Basu and A. Maertens (ed.), *The N ew Oxford Companion to Economics in India*, Oxford University Press, 2013.
10. M. Govinda Rao, 2011, ―Goods and Services Tax: A Gorilla, Chimpanzee or a Genius like Primates?, *Economic and Political Weekly*, February 12-18.
11. M. Govinda Rao, *Changing Contours of Federal Fiscal Arrangements in India, Amaresh Bagchi (ed.), Readings in Public Finance*, Oxford UniversityPress,2005.
12. M.M. Sury, *Government Budgeting in India*, 1990.
13. Mahesh Purohit, *Value Added Tax: Experiences of India and Other Countries,* 2007.
14. Oates, W. E. (1999). An Essay on Fiscal Federalism. Journal of Economic Literature, 37(3), 1120-1149.
15. Paul Samuelson, 1955, ―Diagrammatic Exposition of a theory of Public Expenditure, *Review of Economics and Statistics,* Volume 37.
16. R.A. Musgrave and P.B. Musgrave, *Public Finance in Theory & Practice,* McGraw Hill Publications, 5th edition, 1989.
17. Rangarajan and D.K. Srivastava, 2005, ―Fiscal Deficit and Government Debt: Implications for Growth and Stabilizati*on", Economic and Political Weekly,* July2-8.
18. Report of the Finance Commission (Latest).
19. Roemer, J. (1998).Theories of Distributive Justice. Harvard University Press.
20. Shankar Acharya, 2005, ―Thirty Years of Tax Reform in India‖, *Economic and Political Weekly,* May 14-20.
21. Tiebout, C.M. (1956). A Pure Theory of Local Expenditures. Journal of Public Economics, 64, 416-424

**Master of Science Economics (Honors) 5-Years Integrated**
**Mathematical Economics-1**
**Semester-VII**
**IN-ECX-707**

**External Marks: 80**
**Internal Marks: 20**
**Total Marks: 100 Credits: 4**
**Time: 3hours**

**Note:**

(i) Nine Questions will be set in all and students will be required to attempt 5 questions.

(ii) Question No. 1 will be compulsory and will consist of 8 short answer type questions of 2 marks spread over the entire syllabus (2*8=16 marks).

(iii) For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (16 marks each)

| Content | Learning objectives |
|---|---|
| **UNIT-I**<br>**(i-a)**<br>Mathematical formulation of cardinal and ordinal utility, Marginal rate of Substitution, Consumer Equilibrium,<br>**(i-b)**<br>Consumer's Surplus, Producer's surplus Convexity of Indifference curves, | **(i-a)**<br>Understand, explain, solve and design different forms of utility functions and some recent concepts related to theory of demand using mathematical derivations and optimization.<br>,<br>**(i-b)**<br>Objective is to acquaint the students with the Consumer's Surplus, Producer's surplus Convexity of Indifference curves using mathematical derivations |
| **UNIT-2**<br>**(ii-a)** | **(ii-a)**<br>Objective is to make students'understand different types of Elasticity, and |

| | |
|---|---|
| Elasticity, and mathematical relationship between income, cross and price Elasticity;<br>**(ii-b)**<br>Price, Income and Substitution effects, Derivation of Slutsky's Equation; Derivation of demand function from utility function, | mathematical relationship between income, cross and price Elasticity using mathematical derivations<br>**(ii-b)**<br>Objective is to acquaint the students with the mathematical derivations of Price, Income and Substitution effects, Derivation of Slutsky's Equation; Derivation of demand function from utility function, |
| **UNIT-3**<br><br>**(iii-a)**<br>Production function: Homogeneous and Non-homogeneous, Returns to scale, Return to a factor,<br>.<br>**(iii-b)**<br>Properties of Cobb-Douglas and CES Production function, Euler's theorem, and its applications | **(iii-a)**<br>Objective is to make students' understand different types of Production function: Homogeneous and Non-homogeneous, Returns to scale, Return to a factor using mathematical derivations<br>**(iii-b)**<br><br>Objective is to acquaint the students with mathematical derivations of the Properties of Cobb-Douglas and CES Production function, Euler's theorem, and its application |
| **UNIT-4**<br>**(iv-a)**<br>Isoquants analysis, Elasticity of Substitution, Cost functions, and Inter relationships, mathematical formulation of least cost combination;<br><br>**(iv-b)**<br>Derivation of cost function from production function, Production analysis of multi-product firm | **(iv-a)**<br>Aims at introducing the students about the mathematical derivations of Isoquants analysis, Elasticity of Substitution, Cost functions, and Inter relationships, mathematical formulation of least cost combination;<br>**(iv-b)**<br>Aims at introducing the students about Derivation of cost function from production function, Production analysis of multi-product firm. |

**Suggested Reading List**

1) Allen, R. G. D. (1974): Mathematical Economics, Macmillan, London.
2) Lancaster, V. (1965) : Mathematical Economics, Rand McNally College Pub
3) Silberberg, E. (1990) : The Structure of Economics – A Mathematical Analysis, McGraw Hill 45(17)
4) Rana,RK : Basic Mathematics for Economists,VK Pub
5) Madnani, G. M. K. (2003) : Mathematical Economics, Oxford IBH Publishing Co. Pvt Ltd., New Delhi.
6) Koutsoyiannis, A. (1979), Modern Microeconomics, (2nd Edition), Macmillan Press, London.
7) Henderson, J.M. and R.E. Quandit (1980), Microeconomic Theory: A Mathematical Approach, McGraw Hill, New Delhi.

**Master of Science Economics (Honors) 5-Years Integrated**
**Mathematical Economics-1(P)**
**Semester-VII**
**Practical Presentation (Written/Oral)**
**IN-ECX-708**

**ExternalMarks: 40**
**InternalMarks: 10**
**TotalMarks: 50**
**Credits: 2**
**Time: 3hours**

Work practice

- Graphical derivation of Consumer Equilibrium: Ordinal and Cardinal utility analysis, Mathematical Derivation of Consumer Equilibrium Indifference curves.
- Mathematical derivation of Elasticity of Substitution, APL, MPL, Properties of Cobb-Douglas Production function,
- Graphical derivation of Returns to scale, Return to a factor and Isoquants analysis.

- Mathematical derivation of cost functions from Cobb-Douglas and C.E.S. Production

**Suggested Reading List**

1) Allen, R. G. D. (1974): Mathematical Economics, Macmillan, London.
2) Lancaster, V. (1965) : Mathematical Economics, Rand McNally College Pub
3) Silberberg, E. (1990) : The Structure of Economics – A Mathematical Analysis, McGraw Hill
4) Rana,RK : Basic Mathematics for Economists, VK Pub
5) Madnani, G. M. K. (2003) : Mathematical Economics, Oxford IBH Publishing Co. Pvt Ltd., New Delhi
6) Koutsoyiannis, A. (1979), Modern Microeconomics, (2nd Edition), Macmillan Press, London.
7) Henderson, J.M. and R.E. Quandit (1980), Microeconomic Theory: A Mathematical Approach, McGraw Hill, New Delhi.

# Master of Science Economics (Honors) 5-Years Integrated
# Computer applications for Economists-1
# Semester-VII
# IN-ECX-709

**External Marks: 80**

**Internal Marks: 20**

**Total Marks: 100**

**Credits: 4**

**Time: 3hours**

## Note:

(i) Nine Questions will be set in all and students will be required to attempt 5 questions.

(ii) Question No. 1 will be compulsory and will consist of 8 short answer type questions of 2 marks spread over the entire syllabus (2*8=16 marks).

(iii) For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (16 marks each)

| Content | Learning objectives |
|---|---|
| Unit I:<br><br>Introduction to Computers an Peripehrals Basic components of computer – CPU, Input-Output devices, Keyboard, Mouse and Scanner, Video Display, Printers and Plotters, data storage and retrieval, hard disk, floppy disk,SSD and CDROM. Type of computers and their applications. | Student will be .able to use computer in their personal, academic and professional fields. It provides basic soft skills in handling complex data in addition to creation and formatting of word documents and presentations |
| Unit-II<br><br>Operating systems - concept and types, Windows- concepts and components; Basics of computer network: LAN, WAN and MAN; Introduction to internet and its applications; Working with documents, using tables, pictures and charts; Power points presentation-creating and enhancing a presentation | By the end of the course, the student should be able:<br><br>• To become familiar with basic knowledge on computer |

| | |
|---|---|
| Unit III:<br><br>MS-excel basics, functions, charts, sorting data, filtering data, macros, pivot table.<br><br>Introduction to DBMS, definitions, role, purpose and advantages of databases, basic concepts of data, information, file, record, tables and relationships. | By the end of the course, the student should be able:<br><br>• To become familiar with basic knowledge on computer<br>• To become familiar with a statistical software<br>• To draw distributive tables, graphs, trend lines |
| Unit IV:<br><br>Introduction to e-commerce, e-commerce business models, security in e-commerce. E-payment systems: credit cards, e-cash, e-wallet.<br><br>Economics and Banking: Introduction, definition, concept, need of e-banking. Forms of e-banking. Introduction, concepts, components of wireless banking, risk management. Introduction to cyber crime and cyber law | to introduce the basic concepts of banking as a financial intermediary and bank as a financial institution to the students. |

## Master of Science Economics (Honors) 5-Years Integrated
## Computer applications for Economists-1(P)
## Semester-VII
## Practical Presentation (Written/Oral)
## IN-ECX-710

**External Marks: 40**
**Internal Marks: 10**
**Total Marks: 50**
**Credits: 2**
**Time: 3hours**

Work practice

History, generations, types and components of computers
Introduction to word processing with MS Word
Elements of electronic spread sheets and M.S Excel
Introduction to data base: definition, components and advantages
Challenges and threats for e-security, solutions: cryptography, digital signatures, authentication, digital certificates, and secure socket layer.

## Suggested Reading List


1. Englewood Cliffs, N.J., Techniques and Applications, Prentice Hall
2. Kahate, A. (2008) Information Technology, 3rd Edition, Me Graw Hill, New Delhi.
3. Rajaraman, V. (1996), Fundamentals of Computers, Prentice Hall of India, New Delhi.
4. Sanders D.H. (1988), Computers Today, McGram Hill (3rd Edition) Intrilligator, M.D. (1978), Economic Models.
5. Sinha, P.K & P. Sinha (2004) Computer Fundamentals, 6th Edition, BPB Publications, New Delhi.
6. Wood, M.B. (1983), Introduction Computer Security, Broadman Associates, Delhi.

**Master of Science Economics (Honors)5-year integrated**
**Semester-VIII**
**Advanced Microeconomics-II**
**IN-ECX-801**

**External marks:80**
**Internal Marks:20**
**Total marks:100**
**Credits:4**
**Time: 3 hours**

**Note:**

(i) Nine Questions will be set in all and students will be required to attempt 5 questions.

(ii) Question No. 1 will be compulsory and will consist of 8 short answer type questions of 2 marks spread over the entire syllabus (2*8=16 marks).

(iii) For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (16 marks each)

| Content | Learning objectives |
|---|---|
| **UNIT-1**<br>**Demand Analysis**<br>Elasticity of demand (theoretical aspects and empirical estimation); Recent Development in Demand Theory: Pragmatic approach to demand analysis, Constant Elasticity demand function, distributed lagged models of demand, Nerlov's model, Houthakker's and Taylor's model, Linear expenditure system; Inter temporal choice; Demand Forecasting | After going through this unit, Students shall be able to<br>• Know the concept of demand theory.<br>• Know the pragmatic approach to demand analysis.<br>• Know the concept of constant elasticity of demand function.<br>• Know the stock adjustment principle.<br>• Know the stone analysis of demand and the linear expenditure system. |
| **UNIT-2**<br>**Managerial Theories of Firm**<br>Marginalist Controversy and Managerial and Behavioural Theories of the Firm: Hall & Hitch-Full Cost Pricing, Gordon's attack on Managerialism; Bain's Limit Pricing; Sylos Labini's Limit Pricing. | After going through this unit, Students shall be able to<br>• Know why full cost theory is preferred over profit maximization theory<br>• Why collusive oligopoly tries to maximize long run profits? |
| **UNIT-3** | After going through this unit, Students shall be |

| | |
|---|---|
| **Factor Pricing**<br>Pricing of factors of production (modern approach under perfect and imperfect market); Elasticity of technical substitution and factor shares; Technical progress and factor shares; Macro theories of distribution – Ricardo, Marx, Kalecki and Kaldor. | able to<br>• Learn the concepts of factor prices<br>• Understand how change in factor price affect the distributive shares of the factors.<br>• Formulation of the concept of factor income distribution. |
| **UNIT-4**<br>**Welfare economics**<br>Introduction to Welfare Economics and Pareto Optimality; New welfare economics: Kaldor-Hicks compensation criteria, Scitovsky Paradox; Social Welfare Function: Benthamite, Rawlsian and Bergson-samuelson welfare function. | After going through this unit, Students shall be able to<br>• Know the concept of social welfare function<br>• Learn how welfare is maximized in a society. |

**Advanced Microeconomics-(P)**
**IN-ECX-802**

**External marks:40**
**Internal marks:10**
**Total marks:50**
**Credits:2**
**Time:3 hours**

| |
|---|
| a) Distributed lag model of demand. Demand forecasting<br>b) Full cost pricing<br>c) Technological progress and income distribution<br>d) Pareto Optimality, Social welfare function |

**OVERVIEW OF OUTCOMES ( IN-ECO-801and IN-ECO-802)**
**Advanced Microeconomics II**

**After the successful completion of the course, the students will be able to**
Course Objective:

| | |
|---|---|
| **IN-ECX-801 and 2.1** | Understand, explain, solve the different forms of demand functions; and some recent concepts related to theory of demand and forecasting the demand using mathematical derivations. |
| **IN-ECX-801 and 2.2** | Adopt different analytical concepts and models in framing development and policy-relevant problems particularly factor pricing and income distribution. |
| **IN-ECX-801 and 2.3** | Able to understand new advances in the theory of firm and think critically analyze economic problems in the context of firm. |
| **IN-ECX-801 and 2.4** | Understand the conditions of optimality, social welfare function and thus, able to draw welfare related policy implications. |

**Mapping Matrix of Course Applied Microeconomics II Theory and Practical**
Table: CO-PO Matrix for the Course **IN-ECO-801 and 802**

| CO# | PO 1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ECX-801 and 2.1** | | | | | | | | | | | |
| **ECX-801 and 2.2** | | | | | | | | | | | |
| **ECX-801 and 2.3** | | | | | | | | | | | |
| **ECX-801 and 2.4** | | | | | | | | | | | |
| **Average** | | | | | | | | | | | |

**Suggested Reading List**


1. Archibald, G.C. (Ed.) (1971). *Theory of the Firm*. Penguin, Harmondsworth.
2. Baumol, W.J. (1982). *Economic Theory and Operations Analysis*. Prentice Hall of India, New Delhi.
3. Bronfenbrenner, M. (1979), *Income Distribution Theory*, Macmillan, London.
4. Da Costa, G.C. (1980). *Production, Prices and Distribution*. Tata McGraw Hill, New Delhi.
5. Green, H.A.G. (1971). *Consumer Theory* .Penguin, Harmondsworth.
6. Healthfields and Wibe (1987). *An Introduction to Cost and Production Functions*. Macmillan, London.
7. Henderson & Quandt (1980). *Microeconomic Theory: A Mathematical Approach*. McGraw Hill, New Delhi.
8. Hirshleifer, J. & Glazer, A. (1997). *Price Theory and Applications*. Prentice Hall of India, New Delhi.
9. Hugh Gravelle, Ray Rees (2004) "*Microeconomics, 3rd Edition*" – Pearson Education Limited.
10. Jehle, G. and Reny, P. (2011) *Advanced Microeconomic Theory*. 3rd Edition, Financial Times Prentice Hall, London.
11. Koutsoyiannis, A. (1979). *Modern Microeconomics (2nd Edition).* Macmillan Press, London.
12. Little, I.M.D. (1950; 2002). *A Critique of Welfare Economics*, Oxford
13. Mas-Colell, A., Whinston, M.D., and Green J. (1995): *Microeconomic theory*, Oxford University Press
14. Pindyck R. & Rubinfeld, D. (2018). *Microeconomics (9th Edition)*. Pearson.
15. Salvatore, D. (2009). *Microeconomics-Theory and Applications*. Oxford University Press.
16. Varian, H.R. (2019): *Microeconomic Analysis, third edition*, first Indian edition, W W Norton & Company; 3rd edition

# Master of Science Economics (Honors) 5-Years Integrated
## Advanced Macro Economics-II
**Semester-VIII**
**IN-ECX-803**

**External Marks: 80**
**Internal Marks: 20**
**Total Marks: 100**
**Credit: 4**
**Time: 3hours**

## Note:

(iv) Nine Questions will be set in all and students will be required to attempt 5 questions.

(v) Question No. 1 will be compulsory and will consist of PART-A & B, comprising 10 and 6 marks respectively. All Qs of PART-A and 3 Qs out of 6 from part-B are to be attempted.

(vi) For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (16 marks each).

| Content | Course Objectives |
|---|---|
| **Unit-1**<br>**(i-a)**<br>**Business Cycles:** Schumpeter Theory of Trade Cycle, Samuelson Accelerator–Multiplier Interaction Model, Hicks Theory of Trade Cycles<br>**(i-b)**<br>Kaldor Model, Goodwin Model of Endogenous Cycles, Control of Business Cycles | **(i-a)**<br>Aims at introducing the students about trade cycles, different views about trade cycles.<br>**(i-b)**<br>Has the objective of giving exposure to students about explanation of trade cycles in terms of different approaches and Control of Business Cycles. |

| | |
|---|---|
| **Unit- 2**<br>**Macro-Theories of Distribution:**<br>**(ii-a)**<br>Ricardian Theory of Distribution, Marxian Theory<br>**(ii-b)**<br>Kaldor Theory , Kalecki Theory of Distribution | **(i-a)**<br>Aims at introducing the students about the different views of economists on national income distribution.<br>**(i-b)**<br>\has the objective of giving exposure to students about explanation of Kaldor and Kalecki Theory of Distribution. |
| **Unit-3**<br>**(iii-a)**<br>**Theory of Inflation :**<br>Types of Inflation, Methods of Measuring Inflation Classical & Keynesian Approaches about Inflation.<br>**(iii-b)**<br>Philips Curve Analysis – Short run and Long run Philips curve; Natural Rate of Unemployment Hypothesis; Tobin's modified Philips curve. | **(iii-a)**<br>Objective is to acquaint the students with value of Inflation-typology, measurement and theories of inflation.<br>**(iii-b)**<br>Students are expected to get exposure about Phillips curve short run and long run. |
| **Unit-4**<br>**(iv-a)**<br>**Open Economy Macro Economics:** Monetary Policy and Fiscal Policy, Swan Model, Mundell–Fleming Model.<br>**(iv-b)**<br>External &Internal balance (Equilibrium in the Goods Market, Money Market and Balance of Payment) with IS-LM Model. | **(iv-a)**<br>Aims at introducing to the students about role of Monetary Policy and Fiscal Policy in open economy.<br>**(iv-b)**<br>Students are expected to get exposure about External &Internal balance with IS-LM Model. |

## Master of Science Economics (Honors) 5-Years Integrated
## Advanced Macro Economics-II (P)

**Semester-VIII**

**Practical Presentation (Written/Oral)**

**IN-ECX-804**

**External Marks: 40**

**Internal Marks: 10**

**Total Marks: 50**

**Credits: 2**

**Time: 3hours**

**Presentation (Written& Oral)**

a) Samuelson Accelerator–Multiplier Interaction Model,
b) Hicks Theory of Trade Cycles
c) Control of Business Cycles
d) Classical & Keynesian Approaches about Inflation,
e) Philips Curve Analysis – Short run and long run Philips curve,

**OVERVIEW OF OUTCOMES ( IN-ECX-803 and IN-ECX-804)**

## Advanced Macro Economics- II

**After the successful completion of the course, the students will be able to**

**Course Objective:**

| | |
|---|---|
| **IN-ECX-803 and 3.1** | To apprise the students about nature, pattern and determinants of business cycles and dynamics of transition from phase to phase. |
| **IN-ECX-803 and 3.1** | To give elaborate view of macro distribution of factor shares in an economy through models involving assumptions and their working. |
| **IN-ECX-803 and 3.1** | To elaborate the nature of General Price level in perspective of inflation, and illustrate the monetary policy in action as a package of control measures. |
| **IN-ECX-803 and 3.1** | To display the monetary and fiscal policy mechanism, their co-ordinate working and process of restoration of Internal and External balance of an economy |

**Mapping Matrix of Course Advanced Macro Economics-II (Theory and Practical)**

**Table: CO-PO Matrix for the Course, IN-ECO-803 and 804**

| CO# | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **IN-ECX-803** | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **and 3.1** | | | | | | | | | | | |
| **IN-ECX-803 and 3.2** | | | | | | | | | | | |
| **IN-ECX-803 and 3.3** | | | | | | | | | | | |
| **IN-ECX-803 and 3.4** | | | | | | | | | | | |
| **Average** | | | | | | | | | | | |

**Suggested Reading List**


1) Ackley,G.(1978),Macroeconomics: theory and policy, Macmillan,newyork.
2) Bernankeandabel:Macroeconomics,4thedition
3) Blackhouse, R.anda.Salansi (Eds.)(2000), macroeconomics and the real world(2Vols.),Oxford university press, London.
4) Blanchard: Macroeconomics (Pearson Education),4th edition.
5) Branson,W.A.(1989),macroeconomic theory and policy,(3rdedition), harperandrow, New York.
6) Dernburg,T.F.and D.M.mcdougall, Macroeconomics, mcgraw hill international book company.
7) Dornbusch, fisher and startz:Macroeconomics (tata mcgraw-Hill),9thedition.
8) Dornbusch,R.andf.Stanley(1999),Macroeconomics,irwrinmcgrawhill,Inc.New
9) York,7thedition.
10) Edward shapiro: macroeconomic analysis.
11) Frisch,H.(1983),Theories of Inflation, Cambridge university press, Cambridge.
12) Gardner Ackley: macroeconomic theory
13) Heijdra,B.J.andv.P.Fredericck(2001),FoundationsofModernMacroeconomics,OxfordUniversityPress,New Delhi.
14) Jha, R.(1991), Contemporary Macroeconomic Theory and Policy,Wiley Eastern Ltd., New Delhi.
15) KarlE.Case,RayC.Fair :Principles of Macroeconomics, Publisher: Prentice Hall
16) Lucas, R.(1981), Studies in Business Cycle Theory, MITPress, Cambridge, Masscechusetts.
17) Mankiw N.G: Macroeconomics(Worth Publishers),5thEdition,
18) Mankiw,N.Greogory(2000), Macroeconomics Macmillan Worth Publishers4thEdition.
19) Mankiw,N.G. and D.Romer(Eds.)(1991),NewKeynesianEconomics,(2Vols.),MITPress,Cambridge.
20) Rana&Verma: Macro-economic Analysis.
21) Romer,D.L.(1996),Advanced Macroeconomics, McGraw Hill Company Ltd., NewYork.
22) Ruggles R.and N.Ruggles(1956),National Income Accounts and Income

Analysis McGrawHill, Newyork.
23) Samuelson P.A,and Nordham, W.D(1998): Economics, Tata-McGraw Hill,New Delhi.
24) Sheffirin,S.M. (1996),Rational Expectations, Cambridge University Press, Cambridge.
25) Taylor,L.(1983),StructuralistMacroeconomics,BasicBooks,NewLongman .Turnovsky,S.J. (1977),Macroeconomic Analysis and Stabilization Policy, Cambridge University Press, Cambridge.
26) Veniers,Y.P. and F.D. Sebold,(1977) Macroeconomics; Models and Policy John Wiley andInc, USA.

**Master of Science Economics (Honors)5-year integrated**
**Semester-VIII**
**Advanced Public Economics-II**
**IN-ECX-805**

**External marks:80**
**Internal Marks:20**
**Total marks:100**
**Credits:4**
**Time: 3 hours**

**Note:**

(i) Nine Questions will be set in all and students will be required to attempt 5 questions.
(ii) Question No. 1 will be compulsory and will consist of 8 short answer type questions of 2 marks spread over the entire syllabus (2*8=16 marks).
(iii) For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (16 marks each)

| Content | Learning objectives |
|---|---|
| **UNIT-1**<br><br>**(i-a)**<br>Public Choice - Majority Rule - Buchanan and Tullock Model, Bowen-Black Model. Arrow's Impossibility Theorem.<br><br>**(i-b)**<br>Public Choice Under Representative Democracy - Downs Model on Demand and Supply of Government Policy; Niskanen Model of Bureaucratic Behaviour. | After studying this Unit, Students shall be able to<br><br>**(i-a)** Understand translation of individual preferences in terms of public choice through different voting models and know the methods of translating individual preferences into collective choice and understand Arrow's Impossibility Theorem.<br><br>**(i-b)** Aims at introducing the students about the models on Demand and Supply of Government Policy and understand the model of Bureaucratic |

| | |
|---|---|
| | Behaviour. |
| **UNIT-2**<br>**(ii-a)**<br>Public Enterprises - Forms of Organization of Public Enterprises; Pricing Policy of Public Enterprises.<br><br>**(ii-b)**<br>Theory of Second Best; Capacity Constraints and Peak Load Problem. | After studying this Unit, Students shall be able to<br><br>**(ii-a)** Understand the concept of Public Enterprises and its forms<br><br>**(ii-b)** To know the Capacity Constraints and Peak Load Problem |
| **UNIT-3**<br>**(iii-a)**<br>Public Debt - Objectives and Sources of Public Debt; Classification and Effects of Public Debt; Burden Controversy of Public Debt - Classical Theory, Modern Theory,<br><br>**(iii-b)**<br>Buchanan Thesis, Secondary Burden of Public Debt; Public Debt and Inflation; Public Debt Management and Redemption of Public Debt. | After studying this Unit, Students shall be able to<br><br>**(iii-a)** Learn the concept of public debt and know the Classical Debt theory and classical views on public debt.<br><br>**(iii-b)** Learn the methods of public debt re-payment. |
| **UNIT-4**<br>**(iv-a)**<br>Fiscal Federalism - The Decentralisation theorem; Assignment of Functions Among Levels of Government; Tiebout Model and Citizen's Mobility<br><br>**(iv-b)**<br>Theory of Intergovernmental Grants; Budget: Various concepts of Budget, Performance budgeting and Zero based budgeting . | After studying this Unit, Students shall be able to<br>**(iv-a)** Objective is to acquaint the students with the concept of fiscal federalism and Tiebout Model.<br><br>**(iv-b)** Explain the concept and meaning of zero base budgeting and performance budgeting. |

**Advanced Public Economics--II (P)**
**IN-ECX-806**

**External marks:40**
**Internal marks:10**
**Total marks:50**
**Credits:2**
**Time:3 hours**

| |
|---|
| **Presentation (Written& Oral)** |

| |
|---|
| a) Bowen-Black Model<br>b) Capacity Constraints and Peak Load Problem.<br>c) Public Debt Management and Redemption of Public Debt.<br>d) Performance budgeting and Zero based budgeting. |

**OVERVIEW OF OUTCOMES IN-ECO-805 and IN-ECO-806)**

## Advanced Public Economics II

**After the successful completion of the course, the students will be able to**

Course Objective:

| | |
|---|---|
| **IN-ECX-805 and 6.1** | Able to apply economic perspectives on activities of the government sector to become well-informed and engaged participants (citizens, voters, politicians and/or civil servants) in society. |
| **IN-ECX-805 and 6.2** | Understand the concept of Public Enterprises and its forms,<br>to know the Capacity Constraints and Peak Load Problem ,critically analyze the working and pricing of public enterprises. |
| **IN-ECX-805 and 6.3** | Attain fundamental in-depth knowledge of various thoughts regarding public debt along with the sustainability, burden & management of public debt and critically examine the relationship of public debt with important policy issues including inflation and economic growth. |
| **IN-ECX-805 and 6.4** | Understand, explain, apply and present the theory of fiscal federalism in general as well as in context of India. |

**Mapping Matrix of Course Advanced Public Economics Theory and Practical**

Table: CO-PO Matrix for the Course, IN-ECO-805 and 806

| CO# | PO 1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **IN-ECX-805 and 6.1** | | | | | | | | | | | |
| **IN-ECX-805 and 6.2** | | | | | | | | | | | |
| **IN-ECX-805 and 6.3** | | | | | | | | | | | |
| **IN-ECX-805 and 6.4** | | | | | | | | | | | |
| **Average** | | | | | | | | | | | |

**Readings:**

1. Bagchi, Amaresh (Ed.). (2005). Readings in Public Finance. Oxford University Press.
2. Boadway, Robin (1984). Public Sector Economics. Cambridge, Winthrop Publications.
3. *Economic Survey*, Government of India (Latest).
4. H. Rosen, T. Gayer: *Public Finance*, 9th ed., McGraw-Hill/Irwin, 2009.
5. Harvey Rosen, *Public Finance*, McGraw Hill Publications, 7th edition, 2005.
6. J. Hindriks, G. Myles: *Intermediate Public Economics*, MIT Press, 2006.
7. John Cullis and Philip Jones, *Public Finance and Public Choice*, Oxford University Press, 1st edition, 1998.
8. Joseph E. Stiglitz, *Economics of the Public Sector,* W.W. Norton & Company, 3rd edition, 2000.
9. Kaushik Basu and A. Maertens (ed.), *The N ew Oxford Companion to Economics in India*, Oxford University Press, 2013.
10. M. Govinda Rao, 2011, ―Goods and Services Tax: A Gorilla, Chimpanzee or a Genius like Primates?, *Economic and Political Weekly*, February 12-18.
11. M. Govinda Rao, *Changing Contours of Federal Fiscal Arrangements in India, Amaresh Bagchi (ed.), Readings in Public Finance,* Oxford UniversityPress,2005.
12. M.M. Sury, *Government Budgeting in India,* 1990.
13. Mahesh Purohit, *Value Added Tax: Experiences of India and Other Countries,* 2007.
14. Oates, W. E. (1999). An Essay on Fiscal Federalism. Journal of Economic Literature, 37(3), 1120-1149.
15. Paul Samuelson, 1955, ―Diagrammatic Exposition of a theory of Public Expenditure, *Review of Economics and Statistics,* Volume 37.
16. R.A. Musgrave and P.B. Musgrave, *Public Finance in Theory & Practice,* McGraw Hill Publications, 5th edition, 1989.
17. Rangarajan and D.K. Srivastava, 2005, ―Fiscal Deficit and Government Debt: Implications for Growth and Stabilizati*on", Economic and Political Weekly,* July2-8.
18. Report of the Finance Commission (Latest).
19. Roemer, J. (1998).Theories of Distributive Justice. Harvard University Press.
20. Shankar Acharya, 2005, ―Thirty Years of Tax Reform in India‖, *Economic and Political Weekly,* May 14-20.

21. Tiebout, C.M. (1956). A Pure Theory of Local Expenditures. Journal of Public Economics, 64, 416-424

**Master of Science Economics (Honors)5-yearintegrated Semester-I**

**EXPORT-IMPORT PROCEDURE**

IN-ECX-807

**Externalmarks:40**
**InternalMarks:10**
**Total marks:50**
**Credits:2**
**Time:3hours**

**Note:**

(i) NineQuestionswillbesetinallandstudentswillberequiredtoattempt5 questions.

(ii) QuestionNo.1willbecompulsoryandwill consist of 5 short answer type questions of 2 marks spread over the entire syllabus (2*5=10 marks).

(iii) Fortheremainingfourquestions,studentswillattempt1outof2questionsfrome achofthe four units (10 marks each)

| Content | Learning objectives |
|---|---|
| **UNIT-I**<br><br>Documentation in international trade: Aligned Documentation System (ADS); Commercial documents: Documents related to goods, shipment, payment<br><br>Regulatory documents: inspection and legal regulated documents, Official machinery for consultation. | **UNIT-I**<br><br>1. Students will be able to describe the legal framework and procedure governing international trade.<br><br>2. Students will be able to explain the incorporation of various terms in drafting of an export contract and understand the importance of risk management. |
| **UNIT-2**<br>Export contract: Distinction between domestic sales contract and export sales contract,<br>Elements in export contracts.<br>Dispute settlement, Role of ICC; | **UNIT-2**<br><br>1. Students will be able to apply the concepts learned in terms of export order, delivery and |

| | | |
|---|---|---|
| INCOTERMS, | International trade pricing to actual transactions.<br>2. Students will be able to appraise the role and importance of export-import documentation and<br>procedure framework according to commodities and countries. | |
| **UNIT-3**<br><br>Export order processing; shipping and custom clearance of export and import cargo; central excise<br>Clearance; Role of clearing and forwarding agents.<br>Types of risks in international trade, Cargo Insurance and claim Procedures. | **UNIT-3**<br>1. Students will be able to evaluate the nuances of import and export clearance procedures.<br>2. Student will be able to evaluate the risk in international trade, and how to cover this risk from insurance. | |
| **UNIT-4**<br><br>Methods of payment in international trade; documentary collection of export bills, Instruments of payments, Pre-shipment and post-shipment finance<br><br>Main Provisions of FEMA; Procedure and documentation for availing<br>export incentives. | **UNIT-4**<br>1. Students will be able to develop the skills to export-import various commodities in different counties<br>2. Students will be able to develop the skills to avail benefits of various export incentives and promotional schemes given by government. | |

Overview of Outcomes
Core Course-Export-Import procedure

After the successful completion of the course, the students will be able to Course Objective #

Ecx102.1 Have insight about the complete documentation of the export-import procedure

Ecx102.2 Have further understanding of the exports sale and export contracts.

Ecx102.3Have knowledge about nature of processing, shipping and custom clearance of export and import, types of risks in international trade

Ecx102.4 Have understanding about the international payments and guidelines and promotional schemes given by government

Core-Course-Export-Import procedure

| CO# | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ecx102.1 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 3 | 1 | 2 | 1 |
| Ecx102.2 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 1 |
| Ecx102.3 | 3 | 3 | 1 | 2 | 2 | 2 | 1 | 3 | 1 | 2 | 1 |
| Ecx102.4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 3 | 1 | 2 | 1 |
| Average | 3 | 3 | 1.5 | 2 | 1.5 | 1.5 | 1.25 | 3 | 1.25 | 2 | 1 |

**Suggested Reading List**


- C. Rama Gopal, *Export Import Procedures, Documentation and Logistics*, New
- Age International Publishers, New Delhi.
- M. D. Jitendra, *Export Procedures and Documentation*, Rajat Publications.
- Pervin Wadia, *Export Markets and Foreign Trade Management*, Manishka Publications.
- Paras Ram, *Export: What, Where and How*, Anupam, Publications.
- *Government of India, Handbook of Import – Export Procedures*.
- *Nabhi's Exporters Manual and Documentation*.
- *Nabhi's New Import-Export Policy Procedures*

**Modified Scheme for**

**Bachelor of Technology (Textile Engineering) (Credit Based)**

**KURUKSHETRA UNIVERSITY KURUKSHETRA**

**Scheme of Studies/Examination**

**Semester III (w.e.f. session 2023-2024)**

| Sr. No. | Course No./Code | Subject | L:T:P | Hours/Week | Credits | Examination Schedule (Marks) | | | | Duration of Exam (Hrs) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | HTM-901A | Universal Human Values II : Understanding Harmony | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | PCC-TEX-217A | Textile Fibres | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 3 | PCC-TEX-203A | Yarn Manufacturing-I | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 4 | PCC-TEX-205A | Fabric Manufacturing-I | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 5 | PCC-TEX-207A | Textile Chemical Processing-I | 3:0:0 | 3 | 3 | 75 | 25 | 0 | 100 | 3 |
| 6 | PCC-TEX-209LA | Textile Fibre - I Lab | 0:0:4 | 4 | 2 | - | 40 | 60 | 100 | 3 |
| 7 | PCC-TEX-211LA | Yarn Manufacturing-I Lab | 0:0:2 | 2 | 1 | - | 40 | 60 | 100 | 3 |
| 8 | PCC-TEX-213LA | Fabric Manufacturing-I Lab | 0:0:2 | 2 | 1 | - | 40 | 60 | 100 | 3 |
| 9 | PCC-TEX-215LA | Textile Chemical Processing-I Lab | 0:0:2 | 2 | 1 | - | 40 | 60 | 100 | 3 |
| **Total** | | | | **25** | **20** | **375** | **285** | **240** | **900** | |
| 10 | *MC-901A | Environmental Sciences | 3:0:0 | 3 | - | 100 | - | 0 | 100 | 3 |

*MC-901A is a mandatory credit-less course in which the students will be required to get passing marks in the major test.

**Modified Scheme for**

**Bachelor of Technology (Textile Engineering) (Credit Based)**

**KURUKSHETRA UNIVERSITY KURUKSHETRA**

**Scheme of Studies/Examination**

**Semester IV (w.e.f. session 2023-2024)**

| S. No. | Course No./Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of Exam (Hrs) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | HSMC-TEX-216A | Entrepreneurial and Industrial Engineering | 3:1:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 2 | PCC-TEX-204A | Yarn Manufacturing-II | 3:1:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 3 | PCC-TEX-206A | Fabric Manufacturing-II | 3:1:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 4 | PCC-TEX-208A | Textile Chemical Processing-II | 3:1:0 | 4 | 4 | 75 | 25 | 0 | 100 | 3 |
| 5 | PCC-TEX-210LA | Yarn Manufacturing-II Lab | 0:0:2 | 2 | 1 | - | 40 | 60 | 100 | 3 |
| 6 | PCC-TEX-212LA | Fabric Manufacturing-II Lab | 0:0:2 | 2 | 1 | - | 40 | 60 | 100 | 3 |
| 7 | PCC-TEX-214LA | Textile Chemical Processing-II Lab | 0:0:2 | 2 | 1 | - | 40 | 60 | 100 | 3 |
| **Total** | | | | **22** | **19** | **300** | **220** | **180** | **700** | |
| 8 | *MC-902A | Constitution of India | 3:0:0 | 3 | - | 100 | - | 0 | 100 | 3 |
| *MC-902A is a mandatory credit-less course in which the students will be required to get passing marks in the major test. | | | | | | | | | | |

**Note: All the students have to undergo 4 to 6 weeks Industrial Training after 4th semester which will be evaluated in 5th semester**

| Programme Name | Bachelor of Technology (Textile Engineering) | Semester III |
|---|---|---|
| Course Title | **Textile Fibers** | |
| Course Code | **PCC-TEX-217A** | |
| Purpose | To make students understand textile terms, natural fibers and their properties<br>To make students understand production of man-made fibres and their properties. | |
| Course Outcomes | After completing this course student will be able to:<br>**CO1**. define textile terms<br>**CO2**. explain classification of textile fibres<br>**CO3**. enumerate essential and desirable properties (physical and chemical) of textile fibres<br>**CO4**. familiar with natural and man-made fibres used in textile field<br>**CO5**. use the relevant fibres for suitable applications in textile industry | |
| Prerequisite | Knowledge of basic Physics, Chemistry and Mathematics | |

## PCC-TEX-217A
## TEXTILE FIBRES

**LT P**
**3 0 0**

**Sessional: 25 Marks**
**Exam: 75 Marks**
**Total: 100 Marks**
**Time: 3 Hrs**

**Note:**
*Examiner will set nine questions in all. Question no. 1 will be objective type covering all the four units. Eight more questions will be set with two questions from each unit. The students will be required to attempt five questions in total; Question no. 1 compulsorily and one question from each unit.*

**UNIT-I**
General definitions and important terminologies related to textiles; Classification of fibres; Essential and desirable properties of textile fibres and their role in final end-products; Comparison of natural and manmade fibres;
Cotton: Geographical distribution; structure and properties (physical and chemical) of cotton fibres; Different varieties including organic as well as Bt cotton and their properties and applications.

**UNIT-II**
Geographical distribution, extraction, properties and uses of Bast and leaf fibres such as Jute, Hemp, Sisal and Ramie etc.
Varieties of natural silk, rearing of silk worm, properties and uses of various types of silk; silk degumming, reeling, throwing and weighing.

**UNIT-III**
Varieties, sorting and grading of wool, physical and chemical properties of wool, processes involved in the removal of impurities from raw wool, numbering systems of woollen and worsted yarns.
Basic concept of polymer, essential properties of fibre forming polymers, General principles of manufacturing of man-made fibres.

**UNIT-IV**
Brief outline of the manufacturing processes of important man-made fibres, viz. rayons (Viscose and Acetate), polynosic, tencel, nylons, polyester, acrylics, polypropylene, polyolefins, polyacrylonitrile and some technical speciality fibres like aramid, spandex/lycra etc (only flow charts); their Important physical and chemical properties and applications

**Suggested Text Books & References**

1)Kozłowski, R.M., "Handbook of Natural Fibre", 1st Edition, Woodhead Publication, 2012.
2)Lewin M., "Handbook of Fiber Science and Technology (International Fiber Science and Technology)", CRC Press.
4)Gupta V. B. and Kothari V. K., "Manufactured Fiber Technology", Chapman & Hall, London, 1997.
5)Kothari V.K., "Textile Fibers: Developments and Innovations", IAFL Publication, 2000.
6)Simpson W S., Crawshaw G., "Wool: Science and Technology", Woodhead Textile Series, 2002.
7)Mishra S.P., "A text Book of Fiber Science and Technology", New Age International (P) Ltd.
8)Moorthy H.V.S, "Introduction to Textile Fibers", Woodhead Textile Series, 2015.
9)Ghoel E.P.G., Valensky. "Textile Science", CBS Publishers & Distributors, 2ndEdn Reprint- (2005).
10)Bernard P C., "Textile Fiber to Fabric", McGraw Hill Book Co.
11)Morton W.E &Hearle J.W.S., "Physical Properties of Textile Fibers", Textile Institute, U.K.
12)Kothari V.K., "Progress in Textiles: Science & Technology" Vol-2, IAFL Publication New Delhi.
13)Cook G., "Hand Book of Textile Fibers", Vol-1&2, Woodhead Publication.
14)Eichhorn S., Hearle J.W.S., Jaffe M., Kikutani T., "Handbook of Textile Fibre Structure", Vol. I., Wood Head Publication, 2009.
15)https://nptel.ac.in/courses/116102026/24 (21st May, 2019).

## HSMC–TEX–216A Entrepreneurial and Industrial Engineering

| | | |
|---|---|---|
| **Programme Name** | **Bachelor of Technology (Textile Engineering)** | **Semester IV** |
| **Course Title** | **Entrepreneurial and Industrial Engineering** | |
| **Course code** | **HSMC–TEX–216A** | |
| **Purpose** | 1. To acquaint the students with principles of management, Entrepreneurship and Entrepreneurial Skills;<br>2. To make the students understand the concepts of Industrial Engineering | |
| **Course Outcomes** | After completing this course, the students will be able to:<br>**CO1**. take the right decision to optimize resource utilization by improving productivity of Materials, Machines, Money, Methods, Manpower and Management effectively;<br>**CO2**. find alternative best productive methods reducing time, improving human efficiency and minimizing waste;<br>**CO3**. understand the functions and applications of Industrial Engineering | |
| **Prerequisite** | Basic concepts of Social Sciences | |

## HSMC–TEX–216A
## Entrepreneurial and Industrial Engineering

**L T P**
**3 1 0**

**Sessional: 25 Marks**
**Exam: 75 Marks**
**Total: 100 Marks**
**Time: 3 Hrs**

**Note:** *Examiner will set nine questions in total. Question one having objective type questions will be compulsory covering all the units. The remaining eight questions of 15 marks each will be set by taking two questions from each unit. The students will have to attempt five questions in total, first being compulsory and selecting one from each Unit.*

### UNIT I

Entrepreneurship: Meaning and concept, role of entrepreneurship in economic development & new economic reforms, Entrepreneurial Skills, decision process, Factors influencing entrepreneurship; Business Opportunity Identification; Preparing a Business Plan and project reports, Significance, components and feasibility studies of business plans/project reports, Importance of new venture financing, sources of financing

### UNIT II

Industrial Parks (Meaning, features with examples); Special Economic Zone (Meaning, features with examples); Financial institutions and agencies, MSME, Small Scale Industries, Introduction to SIDBI, IDBI, IFCI and various Government agencies like NABARD etc, Carry on Business (COB) license, Environmental Clearance, Introduction to various industrial hazards like fire, mechanical and electrical etc, Introduction to safety rules for prevention of accidents, National

Small Industries Corporation Rules and regulations for exemption from income tax, excise clearance etc., Claiming of draw back in export business.

**UNIT III**

Productivity – importance, concepts and measurements, Work study, Method study, micro -motion study, Production planning and control- Importance of planning - job, batch and mass production- Introduction and need for a new product, Functions of production control at macro and micro levels - Routing, Scheduling, dispatching and follow up etc. Ergonomics and its importance

**UNIT IV**

Introduction to Industrial Engineering - Evolution of modern Concepts in Industrial Engineering - Functions of Industrial Engineering, application of Industrial Engineering. Facility location factors and evaluation of alternate locations, Types of plant layout and their evaluation, Assembly line balancing, Materials handling systems, Inventory Control, inventory control techniques. Job evaluation, merit rating, incentive schemes, and wage administration, Quality control and Inspection.

**Suggested Text Books & References**


1) Cliffon, Davis S & Fyfie, David E, “Project Feasibility Analysis” Wiley, 1977
2) A N Desai, “Environment & Entrepreneur” APH Publishing Corporation, 2009
3) P F Drucker, “Planning a Small-Scale Industry: A Guide to Entrepreneurs” HarperCollins, 2006
4) R Jain, “Developing Entrepreneurship-A Handbook Learning System”, Learning Systems, 1978
5) Pareek, Udai and Venkateswara Rao, “Motion and Time study,” Oxford and IBH Publishing, 2015
6) Ralph M Barnes, “Engineered work Measurement” Wiley India Pvt. Limited, 2009
7) Weldon, ELBS, Marvin E Mundel, Work Study and Ergonomics
8) ILO Ralph & Barnes, Work Study
9) S Dalela and Sourabh, Introduction to Work Study

# Kurukshetra University, Kurukshetra

## (Established by the State Legislature Act XII of 1956)

## ('A+' Grade, NAAC Accredited)

# Scheme of Examination & Syllabus

# of

# M.Tech Applied Geology (5-year Integrated Course)

# Under CBCS-LOCF For the Session 2023-24

# Semester – I to II

**Kurukshetra University Kurukshetra**
**M.Tech Applied Geology (5-year Integrated Course)**
**Kurukshetra University Kurukshetra**
**Semester - I**

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | B23-HSC-101 | English for Technical Writing | 2:0:0 | 2 | 2 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ESC-101 | Programming for Problem Solving | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-BSC-105 | Chemistry | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-BSC-109 | Applied Mathematics-I | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-106 | Biology | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-HSC-103 | English Language Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-105 | Programming for Problem Solving Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-ESC-107 | Manufacturing Processes Workshop | 0:0:4 | 4 | 2 | -- | 40 | 60 | 100 | 3 |
| 9 | B23-BSC-114 | Engineering Chemistry Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 10 | ATU-202 | Environmental Sciences | 3:0:0 | 3 | 0 | 75 | 25 | -- | 100 | 3 |
| Total | | | | 29 | 21 | 425 | 335 | 240 | 1000 | 30 |

**M.Tech Applied Geology (5-year Integrated Course)**
**Kurukshetra University Kurukshetra**
**Semester - II**

| S. No. | Course No./ Code | Subject | L:T:P | Hours/ Week | Credits | Examination Schedule (Marks) | | | | Duration of Exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | End semester Exam | Internal Assessment | Practical Exam | Total | |
| 1 | B23-HSM-101 | Universal Human Values-II: Understanding Harmony and Ethical Human conduct | 3:0:0 | 3 | 3 | 70 | 30 | -- | 100 | 3 |
| 2 | B23-ESC-102 | Engineering Graphics and Design | 1:0:0 | 1 | 1 | 70 | 30 | -- | 100 | 3 |
| 3 | B23-ESC-103 | Basic Electrical and Electronics Engineering | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 4 | B23-BSC-103 | Applied Physics | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 5 | B23-BSC-110 | Applied Mathematics-II | 3:1:0 | 4 | 4 | 70 | 30 | -- | 100 | 3 |
| 6 | B23-ESC-106 | Engineering Graphics & Design Lab | 0:0:4 | 4 | 2 | -- | 40 | 60 | 100 | 3 |
| 7 | B23-ESC-108 | Basic Electrical and Electronics Engineering lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| 8 | B23-BSC-113 | Applied Physics Lab | 0:0:2 | 2 | 1 | -- | 40 | 60 | 100 | 3 |
| Total | | | | 24 | 20 | 350 | 270 | 180 | 800 | 24 |

| B23-HSC-101 | English for Technical Writing | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| 2 | - | - | 2 | 70 | 30 | 100 | 3 |
| **Purpose** | To introduce the basics of communication and technical writing skill for the students of Engineering | | | | | | |
| **CO1** | Building up the vocabulary | | | | | | |
| **CO2** | Students will acquire basic proficiency in English including writing skills | | | | | | |
| **CO3** | Students will be able to select the most appropriate mode of communication for a given situation and will be able to speak assertively and effectively. | | | | | | |
| **CO4** | Students will be able to write effective reports, proposals and papers and present themselves professionally through effective resumes and interviews. | | | | | | |

**UNIT- 1**

**Fundamentals of communication skills**

Meaning and types of communication skills, Listening, Speaking, Reading and Writing, Importance of technical communication, Barriers in communication, Tools of effective communication.

**UNIT- 2**

**Vocabulary Building**

Word formation &Synonyms and Antonyms, One-word substitution, Abbreviations of scientific and technical words, phrasal verbs and Idioms.

**UNIT- 3**

**Fundamentals of Writing Skills**

Job application, CV writing, Business letter, Report writing and E-mail writing, redundancies, precise writing skill, Basics of grammar: uses of tenses, subject verb agreement, narration, active voice.

**UNIT- 4**

**Fundamentals of Speaking skills**

Speaking skills, Oral presentation, Body language, Group discussion, Technical Telephonic conversation. Introduction to phonetic sounds, symbol and articulation

**Suggested Books:**


- Practical English Usage. Michael Swan. OUP. 1995.
- Remedial English Grammar. F.T. Wood. Macmillan.2007
- On Writing Well. William Zinsser. Harper Resource Book. 2001
- Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
- Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.
- Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press


**Note:** The paper setter will set the paper as per the question paper templates provided.

| B23-HSC-103 | English Language Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Practical Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| - | - | 2 | 1 | 60 | 40 | 100 | 3 |

## OBJECTIVES

1. Listening comprehension.
2. Pronunciation, intonation, stress and Rhythm.
3. Communication at work place.
4. Group Discussion.
5. Interview.
6. Writing skills: speech writing.

| B23-ESC-101 | Programming for Problem Solving | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| 3 | - | `- | 3 | 70 | 30 | 100 | 3 |
| **CO1** | To learn the fundamentals of computers and to understand the various steps in program development. | | | | | | |
| **CO2** | To learn the syntax and semantics of C programming language. To learn the usage of structured programming approach in solving problems. | | | | | | |
| **CO3** | To learn the usage of structured programming approach in solving problems. | | | | | | |
| **CO4** | To analyze the output based on the given input variables. | | | | | | |

**UNIT-I**

Introduction to Programming; Introduction to components of a computer system (Disks, Memory, Processor, Operating System, Compilers etc.), Algorithm Writing, Flowchart, Pseudocode with examples. From algorithms to programs.

**UNIT-II**

C language variables and data types, Syntax and Logical Errors in compilation, object and executable code. Operator (arithmetic, relational, logical, bitwise operator) and Precedence, Conditional Branching and Loops.

**UNIT-III**

Arrays, Arrays (1-D, 2-D), Character arrays and Strings, Structures, defining structures and Array of Structures, Pointers, Idea of pointers, defining pointers, Use of Pointers in self- referential structures, notion of linked list (no implementation), Function, Functions (including using built in libraries), Parameter passing in functions, call by value.

**UNIT-IV**

Idea of call by reference, Recursion, Recursion as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, File handling in different mode

**Suggested Books:**

- Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.
- E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill.
- Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.

**Note:** An approved question paper template is to be provided to the paper setter.

| B23-ESC-105 | Programming for Problem Solving Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Internal Assessment** | **Practical Exam** | **Total** | **Time (hrs.)** |
| - | - | 2 | 1 | 40 | 60 | 100 | 3 |
| **Purpose** | To understand the various steps in program development, syntax of C programming language and usage of structured programming approach in solving problems. | | | | | | |
| **CO1** | To familiarize with programming environment | | | | | | |
| **CO2** | To solve problems involving if-then-else structures | | | | | | |
| **CO3** | To define and declare simple functions to add, multiply etc | | | | | | |
| **CO4** | To call recursive functions and implement factorial, Fibonacci series | | | | | | |

**LIST OF EXPERIMENTS**

1. To familiarize with programming environment
2. Simple computational problems using arithmetic expressions
3. Problems involving if-then-else structures
4. Iterative problems (e.g., sum of series)
5. 1D Array manipulation
6. Matrix problems (Addition and Multiplication)
7. String operations
8. Simple functions to add, multiply etc...
9. Programming for solving Numerical methods problems
10. Recursive functions factorial, Fibonacci series
11. Pointers and structures
12. File operations (to read from file and write into file)

**Note:** At least 9 experiments to be performed during the semester.

| B23-BSC-114 | Engineering Chemistry Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Practical Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| - | - | 2 | 1 | 60 | 40 | 100 | 3 |
| **Purpose** | To acquaint the students with the knowledge of basic phenomenon/practicals of chemistry | | | | | | |
| **CO1** | To make the students familiar with the titrametric methods for analysing strength of given sample | | | | | | |
| **CO2** | To give exposure and training to handle different instruments used in various experiments of chemistry required in engineering/technological field | | | | | | |

**Choice of 10-12 experiments from the following:**

1. Determination of surface tension of a given liquid by drop number method using Stalagmometer.
2. Determination of relative viscosity by Ostwald viscometer.
3. Determination of viscosity of lubricating oil by Redwood Viscometer.
4. To synthesise drug molecule (Aspirin/ Paracetamol)
5. Determination of refractive index of given organic liquid by Abbe's refractometer.
6. Determination of flash point and fire point of oil by Pensky Martin appratus.
7. Determination of amount of Na and K in given water sample by Flame photometer.
8. Determination of strength of given Hydrochloric acid solution by titrating it with NaOH solution conduct metrically.
9. Determination of strength of given Hydrochloric acid solution by titrating it with NaOH solution using pH meter.
10. Determination of concentration of given sample of KMnO4 using spectrophotometer.
11. Determination of alkalinity of a given water sample.
12. Determination of Calcium and Magnesium hardness by EDTA method.
13. Determination of Chloride content in given water sample.
14. Determination of amount of dissolved oxygen in given water sample by Winkler'smethod.
15. Determination of total iron content present in a given iron ore solution by using KMnO4 as oxidising agent.
16. Determination of partition co-efficient of Iodine in carbon tetrachloride and water.
17. To check the presence of a given compound in a mixture using thin layer chromatography.

**Books:**

- Engineering Chemistry with laboratory experiments by M. S. Kaurav, PHI learning Private ltd.
- AICTE's Prescribed Textbook: Chemistry – I with Lab Manual, Khanna Book Publishing

| B23-BSC-106 | BIOLOGY | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| 3 | - | - | 3 | 70 | 30 | 100 | 3 |
| **Purpose** | To familiarize the students with the basics of Biology and Biotechnology | | | | | | |
| **CO1** | Introduction to Living world, Cell & Organisms. | | | | | | |
| **CO2** | Introduction to Biomolecules and Biocatalyst | | | | | | |
| **CO3** | Introduction of basic Concept of Genetics. | | | | | | |
| **CO4** | Introduction of basic Concept of Genetic Engineering, & Role of Biology in Different fields | | | | | | |

**Unit – I**

Introduction to living world: Concept and definition of Biology; Importance of biology in major discoveries of life Characteristic features of living organisms; Cell ultra-structure and functions of cell organelles like nucleus and endoplasmic reticulum. Difference between prokaryotic and eukaryotic cell. Difference between animal and plant cell.

Classification of Organisms: Classification of the organisms on the basis of Energy, Carbon Utilization, Nitrogen Excretion and Habitat.

**Unit-II**

Introduction to Biomolecules: Definition, general classification and important functions of carbohydrates, lipids, proteins, nucleic acids & Enzymes.

Enzymes as Biocatalysts: General characteristics, nomenclature and classification of Enzymes. Effect of temperature, pH and substrate concentrations on the activity of enzymes. Elementary concept of coenzymes. Mechanism of enzyme action.

**Unit-III**

Genetics: -Mendel's laws of inheritance, Cell Division- Mitosis & meiosis, Genetic Disorders: Single gene & Multiple genes disorders in human.

Human Traits: Genetics of blood groups, Diabetes Type I & II.

**Unit-IV**

Concepts of Genetic Engineering: Definition; Tools used in recombinant DNA Technology: Enzymes, Vectors & Passenger DNA.Role of Biology: Role of Biology in Agriculture, Medicine, Forensic science & Bioinformatics.

**Suggested Books:**


- Introduction to Biotechnology, By Deswal & Deswal, Dhanpat Rai Publications N.A
- Campbell, J. B. Reece, L. Urry, M. L. Cain and S. A. Wasserman, "Biology: A global approach", Pearson Education Ltd, 2014.
- E. E. Conn, P. K. Stumpf, G. Bruening and R. H. Doi, "Outlines of Biochemistry", John Wiley and Sons, 2009.
- D. L. Nelson and M. M. Cox, "Principles of Biochemistry", W.H. Freeman and Company, 2012.
- G. S. Stent and R. Calendar, "Molecular Genetics", Freeman and company, 1978.
- Molecular Biology of cell, 4th ed. Alberts, Bruce et al. Garland Science Publishing, New York.
- Microbiology. Pelczar Jr., M.J.; Chan, E.C.S. and Krieg, N.R. Tata McGraw Hill, New Delhi.
- Lehninger: Principles of Biochemistry, 3rd edition, by David L. Nelson and M.M. Cox. Maxmillan/ Worth publishers.
- Genetics by Snusted& Simmons.
- Molecular Biotechnology: Principles Application of Recombinant DNA. Glick, B. R. and Pasternak, J. J. ASM press Washington DC.

- Kuby's Immunology, Goldsby, R. A. Kindt, T.J, Osborne, B.A. (2003) W. H. Freeman and company, New York.
- Recombinant DNA 2nd Edition. Watson, James D. and Gilman, M. (2001) W.H Freeman and Company, NewYork.


**Note:** The paper setter will set the paper as per the question paper templates provided

| B23-ESC- 107 | Manufacturing Processes Workshop | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Internal Assessment** | **Practical Exam** | **Total** | **Time (hrs.)** |
| - | - | 4 | 2 | 40 | 60 | 100 | 3 |
| **Purpose** | To make student gain a hands-on work experience in a typical manufacturing industry environment. | | | | | | |
| **CO1** | Students will be explained different manufacturing operations used in industries and work on CNC machine and 3D printer. | | | | | | |
| **CO2** | Students will be able to know operations and working in Fitting shop and Electrical and Electronics shops. | | | | | | |
| **CO3** | Students will be able to perform on Carpentry operations. | | | | | | |
| **CO4** | Students will be able to explain metal casting and welding jobs operations. | | | | | | |

## List of Experiments

**A) Manufacturing Operations.**

1. To study various manufacturing methods.
2. To study different machine tools used in manufacturing industries.
3. To prepare a job on a lathe involving facing, outside turning taper turning, step turning, radius making and parting-off. (Practice)
4. To prepare a job involving side and face milling on a milling machine. (Practice)

**B) CNC machining, Additive manufacturing.**

1. To study basics of CNC Machine tool.
2. To study the basics of additive manufacturing.
3. To write and simulate CNC Part program for a CNC Milling machine. (Practice)
4. To write and simulate CNC Part program for a CNC Turning machine. (Practice)
5. Modelling and converting CAD models into STL files, and Fabrication of one simple component using 3D printer from CAD models using polymers. (Practice).

**C) Fitting operations.**

1. To Study various Fitting operations and tools used in Fitting shop.
2. To make a V-groove and V-notch in MS flat. (Practice)

**D) Electrical and Electronics operations.**

1. To study basics of house wiring
2. To Make an electrical connection to demonstrate domestic voltage and current sharing. (Practice)
3. To perform Soldering of a resistor on a PCB. (Practice)

**E ) Carpentry operations.**

1. To study steps various tools used in Carpentry shop.
2. To make wooden halving joint (or Cross-Joint) of soft wood. (Practice)

**F) Metal Casting operations.**

1. To study various components of Sand Mould and operations involved in the casting process used in Foundry shop.
2. To test different properties of Sand mould. (Practice)

**G) Welding operations.**

1. To study various processes and tools used in welding shop.
2. To make a Butt joint using the given two M.S pieces by arc welding. (Practice)
3. To make a Lap joint using the given two M.S pieces by arc welding. (Practice)

**Note:** At least one experiment may be performed from each of the categories from A to G (Preferably from Practice type). In total at least 8 experiments need to be performed by the students.

**Suggested Books:**


- Workshop / Manufacturing Practices (with Lab Manual) by Veerana D.K(AICTE Prescribed Text book as per model curriculum)
- Veerana D. K. Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology",7th edition, Pearson Education India Edition.
- Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
- Gowri P. Hariharan and A. Suresh Babu," Manufacturing Technology – I" Pearson Education, 2008.
- Roy A. Lindberg, "Processes and Materials of Manufacture" , 4th edition, Prentice Hall India, 1998
- Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGraw-Hill House, 2017.

| B23-HSM-101 | Universal Human Values II: Understanding Harmony and Ethical Human Conduct | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| 3 | - | - | 3 | 70 | 30 | 100 | 3 |
| **Purpose** | Purpose and motivation for the course, recapitulation from Universal Human Values-I | | | | | | |
| **CO1** | To enable the students, appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings | | | | | | |
| **CO2** | To facilitate the development of a Holistic perspective among students towards life and Profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence | | | | | | |
| **CO3** | To develop understanding Harmony in the Family and Society and the Vision for the Universal Human Order | | | | | | |
| **CO4** | To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature. | | | | | | |

**Unit 1**

**Course Introduction - Need, Basic Guidelines, Content and Process for Value Education**

Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education), Understanding Value Education, Self-exploration as the Process for Value Education; Continuous Happiness and Prosperity- A look at Basic Human Aspirations; current scenario, Method to fulfil the Basic Human Aspirations; concept of natural acceptance and ways to explore it.

**Unit 2**

**Understanding Harmony in the Human Being**

Understanding human being as a co-existence of the Self and Body;
Understanding, exploring and distinguishing between the needs of Self and Body, Understanding the Body as an instrument of Self; Understanding Harmony in the Self, Exploring Sources of Imagination in the Self, Harmony of the Self with the Body, Program to ensure self- regulation and Health, Exploring Harmony of Self with the Body

**Unit 3**

**Understanding Harmony in the Family and Society**

Harmony in the Family – the Basic Unit of Human Interaction, 'Trust' – the Foundational Value in Relationship, Exploring the Feeling of Trust, 'Respect' – as the Right Evaluation, Exploring the Feeling of Respect, Other Feelings, Justice in Human-to- Human Relationship, Understanding Harmony in the Society, Vision for the Universal Human Order, Exploring Systems to fulfill Human Goals.

**Unit 4**

**Understanding Harmony in the Nature and Existence, Implications of the Holistic Understanding – a Look at Professional Ethics**:

Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfillment among the Four Orders of Nature, Exploring the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, the Holistic Perception of Harmony in Existence, Exploring Co-existence in Existence. Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, Exploring Ethical Human Conduct, A Basis for

Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in Professional Ethics, Exploring Humanistic Models in Education, Holistic Technologies, Production Systems and Management Models-Typical Case Studies, Strategies for Transition towards Value-based Life and Profession, Exploring Steps of Transition towards Universal Human Order.

**Suggested Books:**


- The Textbook - A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93- 87034-47-1
- The Teacher's Manual- Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, RR Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53.
- Professional Ethics and Human Values, Premvir Kapoor, ISBN: 978-93-86173-652, Khanna Book Publishing Company, New Delhi, 2022.
- JeevanVidya, Ek Parichaya, A Nagaraj, JeevanVidya Prakashan, Amarkantak, 1999.
- Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
- The Story of Stuff (Book).
- The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi.
- Small is Beautiful - E. F Schumacher.
- Slow is Beautiful - Cecile Andrews.
- Economy of Permanence - J C Kumarappa.
- Bharat Mein Angreji Raj – Pandit Sunderlal.
- Rediscovering India - by Dharampal
- Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
- India Wins Freedom - Maulana Abdul Kalam Azad
- Vivekananda - Romain Rolland (English)


**Note:** The paper setter will set the paper as per the question paper templates provided.

| B23-ESC- 102 | ENGINEERING GRAPHICS AND DESIGN | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| 1 | - | - | 1 | 70 | 30 | 100 | 3 |
| **Purpose** | To draw and interpret various projections of 1D, 2D and 3D objects. To understand the basics of AUTOCAD and perform exercises. | | | | | | |
| **CO1** | Students will be able to draw the projections of points and straight lines | | | | | | |
| **CO2** | Students will be able to understand and draw the projections of planes and regular solids. | | | | | | |
| **CO3** | Students will be able to understand the sectioning of solids and development of surfaces. | | | | | | |
| **CO4** | Students will be able to draw the isometric projections and know different commands used in AUTOCAD. | | | | | | |

**UNIT-I**

**Introduction, Projection of Points:**

Introduction to Engineering Equipment's, Elements of Engineering Drawing, Types of Lines, Various types of projections, First and third angle systems of orthographic projections.

**Projections of points in different quadrants.**

Projections of straight lines – parallel to one or both reference planes, contained by one or both planes, perpendicular to one of the planes, inclined to one plane but parallel to the other plane, inclined to both the planes, true length of a line and its inclinations with reference planes, traces of a line.

**UNIT-II**

**Projection of planes:**

Introduction, types of planes, Projection of planes by change of position method only, projection of plane perpendicular to a plane, with axis parallel to both planes, with axis parallel to one plane and inclined to the other plane.

**Projection of Regular Solids:**

Types of solids, Projections of Polyhedra Solids and Solids of Revolution – in simple positions with axis perpendicular to a plane, with axis parallel to both planes, with axis parallel to one plane and inclined to the other.

**UNIT-III**

**Sections and Sectional Views of Right Regular Solids:**

Sectional views of simple right regular solids like prism, pyramid, Cylinder and Cone.

**Development of Surfaces:**

Development of surfaces of Right Regular Solids-Prism, Pyramid, Cylinder and Cone;

**UNIT-IV**

**Isometric/Orthographic Projections and CAD commands:**

Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions;
Solid works basics; Basic Commands: Line, Point, Rectangle, Polygon, Circle, Arc, Ellipse, Polyline
Basic editing Commands: Extrude Bose, Revolve Bose, Copy, Offset, Fillet, Chamfer, Trim, Extend, Mirror
Display Commands: Zoom, Pan, Redraw, and Regenerate Simple dimensioning and text, simple exercises.

**Suggested Books:**

- Engineering Graphics using AUTOCAD 2000: T. Jeyapoovan, Vikas Publishing House.
- Machine Drawing: Dr Basudeb Bhattacharyya, Oxford University Press, New Delhi
- Engineering Drawing: Amar Pathak, Dreamtech Press, New Delhi.
- Engineering Drawing: Plane and Solid Geometry: N.D. Bhatt and V.M. Panchal, Charotar Publishing House.
- Thomas E. French, Charles J. Vierck, Robert J. Foster, “Engineering drawing and graphic technology”, McGraw Hill International Editions.
- Engineering Graphics and Drafting: P.S. Gill, Millennium Edition, S.K. Katariaand Sons.
- A Primer on Computer aided Engineering Drawing-2006, published by VTU, Belgaum.

| B23-ESC-106 | Engineering Graphics and Design Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Internal Assessment** | **Practical Exam** | **Total** | **Time (hrs.)** |
| - | - | 4 | 2 | 40 | 60 | 100 | 3 |
| **Purpose** | To make student practice on engineering graphics and design software and provide exposure to the visual aspects of engineering design. | | | | | | |
| **CO1** | Students will be able to understand the user interface and toolboxes in Solidworks software. | | | | | | |
| **CO2** | Students will be able to customize settings of SolidWorks software and produce 2D drawings using SolidWorks. | | | | | | |
| **CO3** | Students will be able to practice & learn performing various operations in SolidWorks and create 3D designs. | | | | | | |
| **CO4** | Students will be able to make assembly and create a simple design project. | | | | | | |

**Module 1: Overview of SolidWorks:**

Listing the computer technologies that impact on graphical communication, Demonstrating Knowledge of the theory of SolidWorks software: the Menu Bar; the SOLIDWORKS Menus; Quick Access Tools; Command Manager; Feature Manager Design Tree; Heads-Up View Toolbar; Graphics Area; Task Pane; Status Bar; Quick Access Tools; The name of the currently open file; The search prompt (search Commands, Help, Files etc.); User login credentials; SOLIDWORKS Help; Application window options (minimize, maximize, close).

**Module 2: Customization & SolidWorks Drawing in 2D:**

Setup of the drawing page and the printer, including scale settings, setting up of document units and drawing limits; ISO and ANSI standards for coordinate dimensioning and tolerancing; Orthographic constraints, Snap to objects manually and automatically; Trim entities; convert entities.

Sketch; Evaluate; SOLIDWORKS Add-Ins; Producing drawings by using various coordinate input entry methods to draw line, rectangle, circle, slots, arcs, conic sections, spline, polygons etc; smart dimensions; applying annotations to drawings; modifying various entities (viz line, rectangle, circle, slots, arcs, conic sections, spline, polygons etc.); 2D Fillet and chamfer; 2D mirror; linear sketch pattern.

**Module 3: Miscellaneous operations and 3D designs:**

Drawing; Annotation; Sketch; Markup; Evaluate; SOLIDWORKS Add-Ins; Sheet Format; Features (or Assembly, in an Assembly file); 3D entities (boss and cuts): Extrude boss/base/cut, revolve boss/base/cut, swept boss/base/ cut, Lofted boss/base/cut, Boundary boss/base/cut; 3D Fillet and Chamfer; 3D mirror; 3D linear and circular patterns; reference geometry.

**Module4: Assembly & creating a simple design project:**

Drawing annotation, Solidworks modeling of parts and assemblies; Geometry and topology of engineered components: creation of engineering models and their presentation in standard 3D; Use of SolidWorks software for creating parts and assemblies: Wheel support assembly, V- Block assembly etc. Applying colour coding to parts and assemblies; meshed topologies for engineering analysis and tool-path generation for component manufacture; geometric dimensioning and tolerancing.

**Suggested Books:**

- Beginner's Guide to SOLIDWORKS 2021 - Level II: Sheet Metal, Top Down Design, Weldments, Surfacing and Molds 1st Edition - by Alejandro Reyes; SDC Publications; 1st edition (March 4, 2021).
- SOLIDWORKS 2021: A Step-By-Step Tutorial Guide for Beginners (Mixed Units) - by SDCAD Academy.
- SOLIDWORKS 2019: A Power Guide for Beginners and Intermediate User Paperback –
- March 6, 2019 by CADArtifex, John Willis, Sandeep Dogra.
- Solidworks for Beginners: Getting Started with Solidworks Learn by Doing New Edition 2018 Paperback – October 8, 2018 by Arsath Natheem.

| B23-ESC-103 | Basic Electrical and Electronics Engineering | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| 3 | 1 | `- | 4 | 70 | 30 | 100 | 3 |
| **CO1** | Deals with DC networks, AC fundamentals & AC response of RLC circuits. | | | | | | |
| **CO2** | Deals with introductory Balanced Three Phase Power System analysis, magnetic circuits and Single-Phase Transformer. | | | | | | |
| **CO3** | Explains the Basics of Electrical Machines (AC/DC). | | | | | | |
| **CO4** | Study of Introduction to Analog Electronics & Digital Electronics Fundamentals. | | | | | | |

**UNIT-I**

Review of D.C. circuits: Ohm's Law, junction, node, circuit elements classification: Linear & nonlinear, active & passive, lumped & distributed, unilateral & bilateral with examples. KVL, KCL, Nodal analysis, Star-Delta transformation of set of resistors.

DC Network Theorems: Superposition, Thevenin's, Norton's theorems in DC networks containing both voltage and current sources and Maximum power transfer theorem in a resistive network.

AC Fundamentals & AC Circuit: AC signal, Average and RMS values of sinusoidal AC, polar & rectangular form of representation phasor quantities. Addition & subtraction of two or more phasor sinusoidal quantities using the component resolution method. Steady-state AC response of R/L/C, RL, RC series ckts, P.F., active, reactive & apparent power. Qualitative analysis of Frequency response of series & parallel RLC circuit.

**UNIT-II**

Balanced 3-Phase AC Circuits: Advantages of 3-phase system, Star and Delta connections and their Line and Phase voltage/current relationships, three-phase power & its measurement using the 2-wattmeter method.

Single phase transformer (only qualitative analysis): MMF, Reluctance and flux flow in a magnetic circuit.

Transformer: Principle – Construction - Emf equation - Phasor diagram and Equivalent Circuit, Losses in a transformer, Maximum efficiency condition, OC/SC Test & direct load test.

**UNIT-III (Only Qualitative Analysis)**

Principle of Dynamo for generation of AC. Relation between synchronous speed, number of field poles and frequency. Principle of motoring. Torque & Mechanical Power developed at a rotating shaft & B.H.P.

DC Machines: Constructional parts & principles of working of DC Machines, Generated and back EMF, Types of DC machines, Speed Control of DC shunt Motor, applications.

3-Phase Induction Motor: Basic working principle & construction of a 3- phase Induction motor, slip & advantages. Phase sequence and its importance.

Synchronous Machines: Basic principle of working of Alternator and synchronous motor.

**UNIT-IV**

Analog Electronics Basics (Only Qualitative Analysis): PN junction diode characteristics: forward and reverse bias, breakdown – barrier potential, Zener diode, Basic Rectifier circuits: half wave and full wave, Introduction to BJT: characteristics curve and region of operation.

Digital Fundamentals: Diode as a binary switch, decimal to binary number representation, addition subtraction and basic Boolean algebra, Basic Logic Gates with truth table.

**Suggested Books**:


1. Basic Electrical Engg: A complete Solution by Vijay Kumar Garg, Wiley India Ltd.
2. Electrical Engg. Fundamentals by Rajendra Prasad, PHI Pub.
3. Basic Electrical and Electronics Engg. by S.K. Sahdev, Dhanpat Rai & Co./Pearson.
4. A.K. Maini, Digital Electronics, Wiley India


**Note:** An approved question paper template is to be provided to the paper setter.

| B23-ESC-108 | Basic Electrical and Electronics Engineering Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Internal Assessment** | **Practical Exam** | **Total** | **Time (hrs.)** |
| - | - | 2 | 1 | 40 | 60 | 100 | 3 |
| **Purpose** | To familiarize the students with introductory Electrical & Electronics Engineering practicals. | | | | | | |
| **CO1** | Deals with various DC network theorems to analyse linear circuits. Deals with the steady-state frequency response of RLC circuit parameters solution techniques | | | | | | |
| **CO2** | Deals with introductory Single-Phase Transformer & 3 phase power measurement practicals | | | | | | |
| **CO3** | Deals with the introductory practicals of various types of motors. | | | | | | |
| **CO4** | Deals with various introductory experiments w.r.t Analog & Digital Electronics. | | | | | | |

**LIST OF EXPERIMENTS LIST-I**

1. To verify KVL and KCL.
2. To verify the Superposition theorem on a linear circuit with at least one voltage & one current source.
3. To verify Thevenin's Theorem on a linear circuit with at least one voltage & one current source.
4. To verify Norton's Theorem on a linear circuit with at least one voltage & one current source.
5. To study frequency response characteristics of a series R-L-C circuit on CRO and determine BW, resonant frequency & maximum current.
6. To study frequency response characteristics of a parallel R-L-C circuit on CRO and determine resonant frequency & minimum current.
7. To perform O.C. and S.C. tests on a single-phase transformer.
8. To perform a direct load test on a single-phase transformer and plot load v/s efficiency characteristics.
9. Measurement of power of a 3-phase balanced load by two-wattmeter method.
10. To perform speed control of the DC shunt motor.
11. To study cut-section models of various generators and motors.
12. To perform starting & reversal of direction of a three-phase induction motor.
13. Starting and running of a 3-phase synchronous motor.
14. To study various Safety measures: Need of Earthing, prevention & precautions against electric shock and electric hazards, shock treatment. General Precautions followed in performing practicals in BEEE Lab.

**LIST-II**

1. To study the VI characteristics of the p-n diode in forward and reverse bias and find the threshold voltage from the VI curve.
2. To study the operation of half-wave and full-wave rectifiers and observe the output waveform.
3. To experimentally plot the input and output characteristics of a given BJT transistor in CE/CB/CC configuration.
4. Study and realization of Logic gates AND, OR, NOT, NAND, NOR, EX-OR, EX- NOR (any four).

**Note:** At least 7 experiments from the List - I & 2 experiments from the List -II to be performed during the semester.

| B23-BSC-105 | Chemistry | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| 3 | 1 | 0 | 4 | 70 | 30 | 100 | 3 |
| **Purpose** | To acquaint the students with the basic phenomenon/concepts of chemistry, the student faces during course of their study in the industry and Engineering field | | | | | | |
| **CO1** | An insight into atomic and molecular orbital and bonding in molecules | | | | | | |
| **CO2** | Knowledge of basic concept of spectroscopic techniques for identification of molecules | | | | | | |
| **CO3** | To understand basics of thermodynamics and periodic properties | | | | | | |
| **CO4** | To understand basics of stereochemistry and various organic reactions | | | | | | |

**UNIT -I**

Molecular orbitals of diatomic molecules. Equations for atomic and molecular orbitals. Energy level diagrams of diatomic molecules (O2, N2, CO, NO, CN, HCl and HF). Pi-molecular orbitals of butadiene. Concept of aromaticity. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.

**UNIT -II**

Spectroscopic techniques and applications: Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational spectroscopy and its applications. Nuclear magnetic resonance and magnetic resonance imaging, surface characterization techniques. Diffraction and scattering.

**UNIT -III**

Ionic, dipolar and van Der Waals interactions. Equations of state of real gases and critical phenomena. Thermodynamic functions: Internal energy, entropy and free energy. Estimations of entropy and free energies. Free energy and EMF. Cell potentials, the Nernst equation and its applications. Periodic properties - Effective nuclear charge, electronic configurations, atomic and ionic sizes, ionization energies, electron affinity and electronegativity, polarizability, oxidation states, coordination numbers and geometries of CCl4, PCl5, H2O, NH3, SF6, IF7 (as per VSEPR theory). Hard soft acids and bases.

**UNIT - IV**

Stereochemistry: Representations of 3 dimensional structures, structural isomers and stereoisomers, configurations and symmetry and chirality, enantiomers, diastereomers, optical activity, absolute configurations and conformational analysis (Ethane, Butane and cyclohexane).

Organic reactions: Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, cyclization and ring openings.

**Suggested Books:**


- AICTE's Prescribed Textbook: Chemistry – I with Lab Manual, Khanna Book Publishing.
- Engineering Chemistry, by Manisha Agrawal.
- University chemistry, by B. H. Mahan.
- Chemistry: Principles and Applications, by M. J. Sienko and R. A. Plane.
- Fundamentals of Molecular Spectroscopy, by C. N. Banwell.
- Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan. AICTE Model Curriculum for UG Degree Course in Computer Science and Engineering 54
- Physical Chemistry, by P. W. Atkins.

| B23-BSC-109 | APPLIED MATHEMATICS-I | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| 3 | 1 | - | 4 | 70 | 30 | 100 | 3 |
| **Purpose** | This course aims to acquaint Biotechnology Engineers with fundamental concepts and tools in Limit, Continuity, Differential & Integral Calculus, and Complex Numbers, enabling them to progressively develop their mathematical proficiency for tackling advanced mathematical principles and applications relevant to their field. | | | | | | |
| **CO1** | To introduce the idea of sets, relations, functions, trigonometric functions, inverse trigonometric functions, these concepts are prerequisite to learn the concepts of differentiation and integration. | | | | | | |
| **CO2** | To introduce the Complex numbers which is fundamental to solve any kind of quadratic equations, Limit is precondition to understand the concept of rate of change and derivative. | | | | | | |
| **CO3** | To develop the essential tool of Continuity and Differentiability needed in evaluating higher order derivatives of functions. | | | | | | |
| **CO4** | To introduce the tools of Indefinite and Definite integrals of functions in a comprehensive manner that are used in various techniques dealing engineering problems. | | | | | | |

**UNIT-I**

**Sets, Relations, Functions**

Sets and its types: Operations on sets, complement of a set, Cartesian Product of sets, relations , functions, types of functions, Trigonometric functions: Introduction, Trigonometric functions, Trigonometric functions of sum and difference of two angles, Trigonometric equations, Inverse Trigonometric functions: Introduction, basic concepts and its properties.

**UNIT-II**

**Pre-Calculus**

Complex Numbers: Introduction, Algebra of Complex Numbers, Modulus and the conjugate of a complex number, quadratic equations,

Limits and Derivatives: Introduction, Limits, Limits of Trigonometric Functions, Derivatives (single variable).

**UNIT-III**

**Differential Calculus**

Continuity and Differentiability: Introduction, Continuity, Differentiability, Exponential and Logarithmic functions, Logarithmic differentiation, Derivatives of functions in parametric forms, second order derivatives, Application of Derivatives (single variable): Increasing and decreasing functions, Maxima and Minima.

**UNIT-IV**

**Integral Calculus**

Integrals: Introduction, Integration as an Inverse process of Differentiation, Method of Integration, Integration by Partial Fractions, Integration by Parts, Definite Integrals: Fundamental theorem of Calculus, Evaluation of Definite Integrals by Substitution, properties of Definite Integrals.

**Suggested Books:**


- G. B. Thomas, R. L. Finney: Calculus and Analytic Geometry, Pearson Education.
- Mathematics Textbook for Class 11th& 12th by NCERT.
- Howard Anton: Calculus, Wiley Publication.
- B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 2023


**Note:** The paper setter will set the paper as per the question paper templates provided.

| B23-BSC-103 | Applied Physics | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| 3 | 1 | - | 4 | 70 | 30 | 100 | 3 |
| **Purpose** | To introduce the basics of physics to the students for applications in Engineering field. | | | | | | |
| **CO1** | Introduce the fundamentals of interference and diffraction and their applications. | | | | | | |
| **CO2** | To make the students aware of the importance of polarization and Ultrasonics. | | | | | | |
| **CO3** | Introduce the basics concepts of laser and its applications. | | | | | | |
| **CO4** | To familiarize with concepts of nuclear radiations and its biological effects. | | | | | | |

**Unit I**

Interference: Principle of Superposition, Conditions for interference, Division of wave-front: Fresnel's Biprism and Applications, Division of amplitude: Wedge-shaped film, Newton's rings and Applications, Michelson Interferometer and Applications.

Diffraction: Types of diffraction, Fraunhofer diffraction at a single slit, Intensity distributiondue diffraction grating, determination of wavelength; Dispersive power and resolving power of diffraction grating.

**Unit II**

Polarization: Polarization of transverse waves, Plane of polarization, Polarization by reflection, Double refraction, Nicol Prism, Quarter and half wave plate, Specific Rotation, Laurent 's half shade polarimeter, Biquartz polarimeter.

Ultrasonics: Ultrasonic waves, Properties of ultrasonic waves, Production of ultrasonic waves: Magnetostriction and Piezoelectric methods, Detection of ultrasonic waves, Measurement of velocity of ultrasonic waves, Applications of ultrasonic waves.

**Unit III**

Laser: Einstein's theory of matter radiation interaction and A and B coefficients; amplification of light by population inversion, different types of lasers: gas lasers (He-Ne, CO2), solid-state lasers (ruby, Neodymium), dye lasers; Properties of laser beams: mono-chromaticity, coherence, directionality and brightness, laser speckles, applications of lasers in science, engineering and medicine.

**Unit IV**

Nuclear radiations and its Biological Effects: Classification of nuclear radiations, Interaction of charged particle (light and heavy) and gamma radiations with matter (basic concepts), Dosimetric units, Relative Biological Effectiveness (RBE), Typical doses from commons sources in the environment, Biological Effects, Maximum Permissible Dose, (MPD), Shielding, Radiation safety in the nuclear radiation laboratory. Biomaterials: Introduction, Classification of biomaterials, Applications.

**Suggested Books:**


- Applied Physics for Engineers, Wiley India Pvt. Ltd.
- Concepts of Modern Physics (5th edition), Tata McGraw-Hill Publishing Company Limited.
- A Textbook of Optics, S. Chand & Company Ltd.
- Techniques for Nuclear and Particle Physics Experiments: A How-to Approach, Springer-Verlag.
- Introduction to Nuclear and Particle Physics, PHI Learning Private Limited.
- Biomaterials: The intersection of Biology and Materials Science, Pearson, New Delhi.


**Note:** The paper setter will set the paper as per the question paper templates provided.

| B23-BSC-113 | Applied Physics Lab | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Practical Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| - | - | 2 | 1 | 60 | 40 | 100 | 3 |
| **Purpose** | To impart the knowledge of basic concepts of Physics in Engineering. | | | | | | |
| **CO1** | To make the students familiar with the experiments related with interference and diffraction. | | | | | | |
| **CO2** | To understand the basic phenomenon of polarization and ultrasonic | | | | | | |
| **CO3** | To impart the practical knowledge of the experiments related with resistance using different methods | | | | | | |

**Note:** Student will be required to perform at least 10 experiments out of the following list.

1. To find the wavelength of monochromatic light by Newton's ring experiment.
2. To find the wavelength of sodium light by Michelson's interferometer.
3. To find the resolving power of telescope.
4. To find the wavelength of sodium light using Fresnel bi-prism.
5. To find the wavelength of various colours of white light with the help of plane transmission diffraction grating.
6. To find the specific rotation of sugar solution by using a Polarimeter.
7. To find the frequency of ultrasonic waves by piezoelectric methods
8. To verify Newton's formula and hence to find the focal length of the given convex lens.
9. To find the frequency of A.C. mains by using Sonometer and horse shoe magnet.
10. To find the resistance of a galvanometer by post office box.
11. To find low resistance by Carrey-Foster bridge.
12. To find the value of high resistance by substitution method.
13. To compare the capacitances of two capacitors by De-Sauty's bridge and hence to find the dielectric constantof a medium.
14. To convert a galvanometer into an ammeter of desired range and verify the same.

**Suggested Books:**


- C.L. Arora, B. Sc. Practical Physics, S. Chand.
- B.L. Worshnop and H, T, Flint, Advanced Practical Physics, KPH.
- S.L. Gupta & V. Kumar, Practical Physics, Pragati Prakashan.

| B23-BSC-110 | APPLIED MATHEMATICS-II | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **End Semester Exam** | **Internal Assessment** | **Total** | **Time (hrs.)** |
| 3 | 1 | - | 4 | 70 | 30 | 100 | 3 |
| **Purpose** | This course aims to equip the students with standard concepts and tools that will serve them well towards tackling more advanced level of mathematics while familiarizing them with essential tool of linear algebra, solution of differential equation, utility of higher order derivatives in engineering domain. More precisely, the objectives are as under: | | | | | | |
| **CO1** | To introduce the essential tool of matrices and linear algebra in a comprehensive manner to solve the large system of linear equations. | | | | | | |
| **CO2** | To introduce effective mathematical tools for the solutions of first order differential equations that model physical processes. | | | | | | |
| **CO3** | To develop the way to solve the ordinary differential equation with higher orders. | | | | | | |
| **CO4** | To extend some concept of differential calculus for more than one variable. | | | | | | |

**UNIT-I**

**Linear Algebra:**

Introduction to matrices, its types, algebraic operations, transpose, determinant, minors and adjoint of a matrix. Elementary transformations, Inverse of a square matrix: Cramer's rule, Rank of a matrix, elementary matrices, Gauss Jordon method to find inverse using elementary transformations.

System of Linear equations: General representation, Homogeneous and Non-homogeneous system of linear equations, Consistency of linear system of equations, Gauss Elimination method to solve the system of linear equations.

**UNIT-II**

**First order Ordinary differential equations:**

Introduction, order and degree of the differential equation, Formation of differential equation, Solution of the differential equation, Solution of the differential equation with variables separable and differential equations reducible to variable separable form, exact differential equation, and equations reducible to exact differential equations, linear and Bernoulli's equations.

**UNIT-III**

**Ordinary differential equations of higher orders**

Introduction, complementary function, particular integrals, solution of second and third order linear differential equations with constant coefficients.

**UNIT-IV**

**Multivariable Calculus:**

Partial derivatives, Total differential, Chain rule for differentiation, Partial derivatives of higher orders, Homogeneous functions, Euler's theorem on homogeneous functions, differentiation of an implicit function, Jacobian, Maxima and minima of a function of two variables, Lagrange's method of undetermined multipliers.

**Suggested Books:**


- G. B. Thomas, R. L. Finney: Calculus and Analytic Geometry, Pearson Education.
- H. Anton, Irl C Bivens, Stephen Davis: Calculus 10th Edition, John Wiley & Sons.
- E. Kreyszig: Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
- E. Kreyszig and S. Ahuja, Applied Mathematics-II, Wiley India Publication, Reprint 2015.
- Srimanta Pal and Subodh C. Bhunia, Engineering Mathematics, Oxford University Press.
- Mathematics Textbook for Class 11th& 12th by NCERT.
- B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 2023


**Note:** The paper setter will set the paper as per the question paper templates provided.

| ATU-202 | Environmental Sciences | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Credit** | **Major Test** | **Minor Test** | **Total** | **Time (hrs.)** |
| 3 | - | - | - | 75 | 25 | 100 | 3 |
| **Purpose** | To learn the multidisciplinary nature, scope and importance of Environmental sciences. | | | | | | |
| **CO1** | Students will be able to learn the importance of natural resources. | | | | | | |
| **CO2** | To learn the of structure and functions of ecosystems. | | | | | | |
| **CO3** | Will be able to understand the biodiversity and its conservation methods. | | | | | | |
| **CO4** | The students will be able to understand the relation between human population and environment. | | | | | | |

**UNIT- I**

The Multidisciplinary nature of environmental studies: Definition; Scope and Importance, Need for public awareness.

Natural resources and associated problems. Forest resources: Use and Over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

**UNIT II**

Concept of an ecosystem: Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Biodiversity and its Conservation: Introduction-Definition: genetic, species and ecosystem diversity. Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels. India as a mega-diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

**UNIT-III**

Environmental Pollution: Definition- Causes, effects and control measures of: - Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, nuclear hazards

Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management: floods, earthquake, cyclone and landslides.

Social Issues and the Environment: From Unsustainable to Sustainable development. Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Case studies. Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. Wasteland reclamation, Consumerism and waste products.

Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and Control

of Pollution) Act. Wildlife Protection Act. - Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness.

**UNIT-IV**

Human Population and the Environment: Population growth, variation among nations. Population explosion-Family welfare Programme. Environment and human health. Human Rights. Value Education. HIV/AIDS. Women and Child Welfare. Role of information Technology in Environment and human health. Drugs and their effects; Useful and harmful drugs; Use and abuse of drugs; Stimulant and depressant drugs. Concept of drug de-addiction. Legal position on drugs and laws related to drugs. Case Studies.

Field Work (Practical). Visit to a local area to document environmental assets-river/forest/grassland/ hill/mountain. Visit to a local polluted site-Urban/Rural/Industrial/Agricultural. Study of common plants, insects, birds. Study of simple ecosystems-pond, river, hill slopes, etc. (Field work equal to 5 lecture hours).

**Suggested Books:**


- Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- BharuchaErach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad -380013, India, Email: mapin@icenet. net (R).
- Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p.
- Clerk B.S., Marine Pollution, Clanderson Pross Oxford (TB).
- Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.
- De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- Down to Earth, Centre for Science and Environment (R).


**Note:** The Examiner will be given the question paper template and will have to set the question paper according to the template provided along with the syllabus.

# SCHEME OF EXAMINATION

# &

# SYLLABI

# of

# Bachelor of Business Administration

*(Honours/Honours with Research)*

## As perNational Education Policy 2020

***with effect from academic session 2023-24***

# Kurukshetra UniversityKurukshetra-136119

**(A+ Grade NAAC Accredited)**

# Abbreviations

| | |
|---|---|
| **AEC** | Ability Enhancement Course |
| **CC** | Core Course |
| **CC-H** | Core course in Honours discipline |
| **CC-HM** | Core Course in Minor Subject of of Honours Program |
| **DSE** | Discipline Specific Elective Course |
| **DSE-H** | Discipline specific elective course in Honours |
| **H** | Honours |
| **M** | Minor |
| **MDC** | Multi-Disciplinary Course |
| **PC** | Practicum Course |
| **PC-H** | Practicum Course in Honours |
| **SEC** | Skill Enhancement Course |
| **V** | Vocational |
| **VAC** | Value Added Course |

# Syllabus of Courses


| Type of courses | Page |
|---|---|
| Compulsory Courses | 22-57 |
| Minor Courses | 58-69 |
| Multidisciplinary Courses | 70-79 |
| Skill Enhancement Courses | 80-86 |
| Value Added Courses | 87-96 |
| Vocational Courses | 97-103 |

## FIRST YEAR: SEMESTER I

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-101 | Financial Accounting | CC-A1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-102 | Principles of Management | CC-B1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-103 | Business Organisation | CC-C1 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of minor courses for Semester I | CC-M1 | 15 | 35 | - | 50 | **2** |
| | Each student will opt one multidisciplinary course from the discipline which is different from the discipline of business administration | MDC-1 | | | | 75 | **3** |
| | Each student will opt one course from pool of ability enhancement courses provided by university | AEC-1 | | | | 50 | **2** |
| | Each student will opt one course from pool of skill enhancement courses provided by university | SEC-1 | | | | 75 | **3** |
| | Each student will opt one course from pool of value added courses provided by university | VAC-1 | | | | 50 | **2** |
| **Total** | | | | | | **600** | **24** |

## POOL OF MINOR COURSES FOR SEMESTER I

| Course | Course Code | Nomenclature of Minor Course |
|---|---|---|
| CC-M1 | B23-BBA-104 | Business Mathematics-I |

## FIRST YEAR: SEMESTER II

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-201 | Business Statistics | CC-A2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-202 | Managerial Economics | CC-B2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-203 | Organisational Behaviour | CC-C2 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of minor courses for Semester II | CC-M2 | 15 | 35 | - | 50 | **2** |
| | Each student will opt one multidisciplinary course from the discipline which is different from the discipline of business administration | MDC-2 | | | | 75 | **3** |
| | Each student will opt one course from pool of ability enhancement courses provided by university | AEC-2 | | | | 50 | **2** |
| | Each student will opt one course from pool of skill enhancement courses provided by university | SEC-2 | | | | 75 | **3** |
| | Each student will opt one course from pool of value added courses provided by university | VAC-2 | | | | 50 | **2** |
| **Total** | | | | | | **600** | **24** |

## POOL OF MINOR COURSES FOR SEMESTER II

| Course | Course Code | Nomenclature of Minor Course |
|---|---|---|
| CC-M2 | B23-BBA-204 | Business Mathematics-II |

**Exit Option:** Any student opting for exit option after first year will get **Undergraduate Certificate in Business Administration** provided he/she completes 48 Credits of first two semesters and additional 4 credits of summer training report (100 External Marks) based on summer training of 4-6 weeks undertaken in a business organization. Thus, he/she will be eligible to exit the course with the said 52 Credits. In addition, the summer internship report would be evaluated by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra. Furthermore, the credits of summer internshipreport would be included/mention in the **Undergraduate Certificate in Business Administration** as follow:

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-205 | Summer Internship Report | Internship | - | 100* | - | 100 | **4** |

*The summer internship report would be evaluated by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

## SECOND YEAR: SEMESTER III

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-301 | Managerial Accounting | CC-A3 | 30 | 70 | - | 100 | **4** |
| B23-BBA-302 | Marketing Management | CC-B3 | 30 | 70 | - | 100 | **4** |
| B23-BBA-303 | Human Resource Management | CC-C3 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of minor courses for Semester III | CC-M3 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one multidisciplinary course from the discipline which is different from the discipline of business administration | MDC-3 | | | | 75 | **3** |
| | Each student will opt one course from pool of ability enhancement courses provided by university | AEC-3 | | | | 50 | **2** |
| | Each student will opt one course from pool of skill enhancement courses provided by university | SEC-3 | | | | 75 | **3** |
| **Total** | | | | | | **600** | **24** |

## POOL OF MINOR COURSES FOR SEMESTER III

| Course | Course Code | Nomenclature of Minor Course |
|---|---|---|
| CC-M3 | B23-BBA-304 | Production Management |
| CC-M3 | B23-BBA-305 | Disaster Management |

## SECOND YEAR: SEMESTER IV

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-401 | Capital Markets | CC-A4 | 30 | 70 | - | 100 | **4** |
| B23-BBA-402 | Business Research Methods | CC-B4 | 30 | 70 | - | 100 | **4** |
| B23-BBA-403 | Business Environment | CC-C4 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of vocational courses provided by university | CC-M4 (V1) | | | | 100 | **4** |
| | Each student will opt one course from pool of ability enhancement courses provided by university | AEC-4 | | | | 50 | **2** |
| | Each student will opt one course from pool of value added courses provided by university | VAC-3 | | | | 50 | **2** |
| **Total** | | | | | | **500** | **20** |

**Exit Option:** Any student opting for exit option after second year will get **Undergraduate Diploma in Business Administration**provided he/she completes 92 credits of first four semesters and additional 4 credits of summer training report (100 external marks) based on summer training of 4-6 weeks in a business organization undertaken after completion of second semester or fourth semester. Thus, he/she will be eligible to exit the course with the said 96 Credits. In addition, the summer internship report would be evaluated by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra. Furthermore, the credits of summer internship report would be included/mention in the **Undergraduate Diploma in Business Administration** as follow:

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-404 | Summer Internship Report | Internship | - | 100* | - | 100 | **4** |

*The summer internship report would be evaluated by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

**Note:**The student seeking admission in fifth semester would have to undergo a compulsory 4-6 weeks summer internship in a business organization after fourth semester and credits for the same will be included in fifth semester.

## THIRD YEAR: SEMESTER V

| Course code | Nomenclature of the paper | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-501 | Corporate Finance | CC-A5 | 30 | 70 | - | 100 | **4** |
| B23-BBA-502 | International Business | CC-B5 | 30 | 70 | - | 100 | **4** |
| B23-BBA-503 | Business Laws | CC-C5 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of vocational courses provided by university | CC-M5 (V2) | | | | 100 | **4** |
| B23-BBA-504 | Summer InternshipReport | Internship | - | 100* | - | 100 | **4** |
| **Total** | | | | | | **500** | **20** |

*The summer internship report would be evaluated by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

## THIRD YEAR: SEMESTER VI

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-601 | Analysis of Financial Statements | CC-A6 | 30 | 70 | - | 100 | **4** |
| B23-BBA-602 | Entrepreneurship Development | CC-B6 | 30 | 70 | - | 100 | **4** |
| B23-BBA-603 | Comprehensive Viva-Voce | CC-C6 | - | - | 100* | 100 | **4** |
| | Each student will opt one course from pool of minor courses for Semester VI | CC-M6 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of vocational courses provided by university | CC-M7 (V3) | | | | 100 | **4** |
| **Total** | | | | | | **500** | **20** |

## POOL OF MINOR COURSES FOR SEMESTER VI

| Course | Course Code | Nomenclature of Minor Course |
|---|---|---|
| CC-M6 | B23-BBA-604 | E-Commerce |
| CC-M6 | B23-BBA-605 | Business Tax Planning |

*Comprehensive viva-voce would be conducted by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

**Exit option:** Any student who exit after 6 semesters must complete 132 credits and he/she would be awarded with **Bachelor of Business Administration.**

**Notes:**

1. A student will opt for Multidisciplinary Course (MDC) from the subject which is different from the discipline of business administration. Students are not allowed to choose or repeat courses already undergone at the higher secondary level (12th class) or opted as major and minor courses under this category. Provided further that if a Multidisciplinary Course across the discipline cannot be offered by the Department/Institute/College, due to its constraints and available resources, then
   i. MDC can be opted out of MOOCs through SWAYAM.
   ii. MDC can be completed out of online courses offered by the Kurukshetra University.
   iii. MDC can be completed from a cluster college, i.e., from a neighboring college/institute.
2. 4-year BBA (Honours) or (Honours with Research) will be offered after completion of 3 year BBA programme to those students who have completed at least 60 credits in the concerned discipline. In addition to the above, 4-year BBA (Honours with Research) will be offered only to those students who have obtained CGPA 7.5 or more in the 3 year BBA programme.
3. BBA (Honours) or (Honours with Research) will be awarded after successful completion of the four year programme securing 180 credits.
4. Student opting for Honours with Research will work on a Research Project or do research during the eighth semester. The dissertation work will be of 12 credits. 8 credits will be earmarked for the evaluation report of the dissertation and viva-voce examination will carry weightage of 4 credits.
5. Students have to opt any one specialisation in the seventh semester from provided specialisations as below and the same will continue in the eighth semester:
   **A. Entrepreneurship**
   **B. Business Analytics**
   **C. Agri-Business**

# Bachelor of Business Administration(Honours)

# A. Entrepreneurship

## Fourth Year: Semester VII

| Coursecode | Nomenclature of thecourse | Category | Internal Marks | External Marks | Practical /Viva-VoceMarks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-711 | Fundamentals of Entrepreneurship Development | CC-H1 | 30 | 70 | - | 100 | 4 |
| B23-BBA-712 | Creativity and New Venture Creation | CC-H2 | 30 | 70 | - | 100 | 4 |
| B23-BBA-713 | Institutional support to Entrepreneur & MSME | CC-H3 | 30 | 70 | - | 100 | 4 |
| | Each student will opt one course from pool of discipline specific elective courses for Semester VII | DSE-H1 | 30 | 70 | - | 100 | 4 |
| B23-BBA-716 | Seminar | PC-H1 | - | - | 100* | 100 | 4 |
| B23-BBA-717 | Labour Laws | CC-HM1 | 30 | 70 | - | 100 | 4 |
| **Total** | | | | | | **600** | **24** |

### POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VII

| Course | CourseCode | Nomenclatureof DisciplineSpecificElectiveCourse |
|---|---|---|
| DSE-H1 | B23-BBA-714 | Family Business Management |
| DSE-H1 | B23-BBA-715 | Social Entrepreneurship |

*Seminar would be assessed by a presentation based on relevant topic assigned to the student by the institute/college and evaluation of the same will be done by the a two members committee comprising of an external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra and Head of Department (or his/her nominee) in concerned college/institute.

## Fourth Year: Semester VIII

| Coursecode | Nomenclature of thecourse | Category | Internal Marks | External Marks | Practical /Viva-VoceMarks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-811 | Enterprise Planning, Appraisal and Financing | CC-H4 | 30 | 70 | - | 100 | **4** |
| B23-BBA-812 | Financial Innovation and Entrepreneurship | CC-H5 | 30 | 70 | - | 100 | **4** |
| B23-BBA-813 | Marketing Management in New Age Businesses | CC-H6 | 30 | 70 | - | 100 | **4** |
| | Eachstudentwilloptone course from pool ofdiscipline specific electivecoursesfor SemesterVIII | DSE-H2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-816 | MSME Policy Framework | PC-H2 | 30 | 70 | - | 100 | 4 |
| B23-BBA-817 | Comprehensive Viva-Voce | CC-HM2 | - | - | 100* | 100 | **4** |
| **Total** | | | | | | **600** | **24** |

### POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VIII

| Course | CourseCode | Nomenclatureof DisciplineSpecificElectiveCourse |
|---|---|---|
| DSE-H2 | B23-BBA-814 | New Enterprises Human Resource Management |
| DSE-H2 | B23-BBA-815 | Digital Entrepreneurship |

*****Comprehensive viva-voce would be conducted by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

**Note:**Studentcompleting180creditswouldbeeligibletoobtain**BachelorofBusinessAdministration(Honours).**

# Bachelor of Business Administration(Honours with Research)

## A. Entrepreneurship

### Fourth Year: Semester VII

| Coursecode | Nomenclature of thecourse | Category | Internal Marks | External Marks | Practical /Viva-VoceMarks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-711 | Fundamentals of Entrepreneurship Development | CC-H1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-712 | Creativity and New Venture Creation | CC-H2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-713 | Institutional support to Entrepreneur & MSME | CC-H3 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of discipline specific elective courses for Semester VII | DSE-H1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-716 | Seminar | PC-H1 | - | - | 100* | 100 | 4 |
| B23-BBA-717 | Labour Laws | CC-HM1 | 30 | 70 | - | 100 | **4** |
| **Total** | | | | | | **600** | **24** |

### POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VII

| Course | CourseCode | Nomenclatureof DisciplineSpecificElectiveCourse |
|---|---|---|
| DSE-H1 | B23-BBA-714 | Family Business Management |
| DSE-H1 | B23-BBA-715 | Social Entrepreneurship |

*Seminar would be assessed by a presentation based on relevant topic assigned to the student by the institute/college and evaluation of the same will be done by the a two members committee comprising of an external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra and Head of Department (or his/her nominee) in concerned college/institute.

## Fourth Year: Semester VIII

| Coursecode | Nomenclature of thecourse | Category | Internal Marks | External Marks | Practical /Viva-VoceMarks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-811 | Enterprise Planning, Appraisal and Financing | CC-H4 | 30 | 70 | - | 100 | **4** |
| B23-BBA-812 | Financial Innovation and Entrepreneurship | CC-H5 | 30 | 70 | - | 100 | **4** |
| B23-BBA-817 | Comprehensive Viva-Voce | CC-HM2 | - | - | 100* | 100 | **4** |
| B23-BBA-818 | Research Project | Project/ Dissertation | 0 | 200** | 100*** | 300 | **8+4 =12** |
| **Total** | | | | | | **600** | **24** |

*****Comprehensive viva-voce would be conducted by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

******ProjectReportwillbeevaluatedbyexternalexaminerfrompanelapprovedby UGBOSofUniversitySchoolofManagement,KurukshetraUniversity,Kurukshetra.

*******Viva-VoceonProjectReportwillbeconductedbyExternalExaminerfrompanelapprovedbyUGBOSofUniversitySchoolofManagement,KurukshetraUniversity,Kurukshetra.

**Note:**Studentscompleting180creditswouldbeeligibletoobtain**BachelorofBusinessAdministration(HonourswithResearch).**

# Bachelor of Business Administration(Honours)

# B. Business Analytics

## Fourth Year: Semester VII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-721 | Business Analytics | CC-H1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-722 | Business Analysis using Excel | CC-H2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-723 | Fundamental of Econometrics | CC-H3 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool ofdiscipline specific elective courses for Semester VII | DSE-H1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-726 | Seminar | PC-H1 | - | - | 100* | 100 | **4** |
| B23-BBA-727 | Digital Marketing | CC-HM1 | 30 | 70 | - | 100 | **4** |
| **Total** | | | | | | **600** | **24** |

### POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VII

| Course | Course Code | Nomenclature of Discipline Specific ElectiveCourse |
|---|---|---|
| DSE-H1 | B23-BBA-724 | Decision Modelling and Data Analysis |
| DSE-H1 | B23-BBA-725 | Data Mining and Data Warehousing |

*Seminar would be assessed by a presentation based on relevant topic assigned to the student by the institute/collegeandevaluationofthesamewillbedonebytheatwomemberscommitteecomprisingofanexternalexpertfrom panelapprovedbyUGBOSofUniversitySchoolofManagement,KurukshetraUniversity,Kurukshetra andHeadof Department(orhis/hernominee)inconcernedcollege/institute.

## Fourth Year: Semester VIII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-821 | Time Series Data Analysis | CC-H4 | 30 | 70 | - | 100 | **4** |
| B23-BBA-822 | Applied Multivariate Analysis | CC-H5 | 30 | 70 | - | 100 | **4** |
| B23-BBA-823 | Financial Modeling | CC-H6 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool ofdiscipline specific elective courses for Semester VIII | DSE-H2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-826 | Market Microstructure | PC-H2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-827 | Comprehensive Viva-Voce | CC-HM2 | - | - | 100* | 100 | **4** |
| **Total** | | | | | | **600** | **24** |

### POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VIII

| Course | Course Code | Nomenclature of Discipline Specific Elective Course |
|---|---|---|
| DSE-H2 | B23-BBA-824 | Predictive Analysis for Business Decision |
| DSE-H2 | B23-BBA-825 | Social Media Analytics |

*****Comprehensive viva-voce would be conducted by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

**Note:** Student completing 180 credits would be eligible to obtain **Bachelor of Business Administration (Honours).**

# Bachelor of Business Administration (Honours with Research)

# B. Business Analytics

## Fourth Year: Semester VII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-721 | Business Analytics | CC-H1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-722 | Business Analysis using Excel | CC-H2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-723 | Fundamental of Econometrics | CC-H3 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool ofdiscipline specific elective courses for Semester VII | DSE-H1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-726 | Seminar | PC-H1 | - | - | 100* | 100 | **4** |
| B23-BBA-727 | Digital Marketing | CC-HM1 | 30 | 70 | - | 100 | **4** |
| **Total** | | | | | | **600** | **24** |

### POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VII

| Course | Course Code | Nomenclature of Discipline Specific Elective Course |
|---|---|---|
| DSE-H1 | B23-BBA-724 | Decision Modelling and Data Analysis |
| DSE-H1 | B23-BBA-725 | Data Mining and Data Warehousing |

*Seminar would be assessed by a presentation based on relevant topic assigned to the student by the institute/collegeandevaluationofthesamewillbedonebytheatwomemberscommitteecomprisingofanexternalexpertfrom panelapprovedbyUGBOSofUniversitySchoolofManagement,KurukshetraUniversity,Kurukshetra andHeadof Department(orhis/hernominee)inconcernedcollege/institute.

## Fourth Year: Semester VIII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-821 | Time Series Data Analysis | CC-H4 | 30 | 70 | - | 100 | **4** |
| B23-BBA-822 | Applied Multivariate Analysis | CC-H5 | 30 | 70 | - | 100 | **4** |
| B23-BBA-827 | Comprehensive Viva-Voce | CC-HM2 | - | - | 100* | 100 | **4** |
| B23-BBA-828 | Research Project | Project/ Dissertation | 0 | 200** | 100*** | 300 | **8+4 =12** |
| | | | | | | | |
| **Total** | | | | | | **600** | **24** |

*Comprehensive viva-voce would be conducted by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

**ProjectReportwillbeevaluatedbyexternalexaminerfrompanelapprovedby UGBOSofUniversitySchoolofManagement,KurukshetraUniversity,Kurukshetra.

***Viva-VoceonProjectReportwillbeconductedbyExternalExaminerfrompanelapprovedbyUGBOSofUniversitySchoolofManagement,KurukshetraUniversity,Kurukshetra.

**Note:** Students completing 180 credits would be eligible to obtain **Bachelor of Business Administration (Honours with Research).**

# Bachelor of Business Administration (Honours)

# C. Agri-Business

## Fourth Year: Semester VII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-731 | Agri-Business Entrepreneurship | CC-H1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-732 | Food Technology and Process Management | CC-H2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-733 | Agri-Business Management | CC-H3 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool ofdiscipline specific elective courses for Semester VII | DSE-H1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-737 | Seminar | PC-H1 | - | - | 100* | 100 | **4** |
| B23-BBA-738 | Management of Agribusiness Cooperatives | CC-HM1 | 30 | 70 | - | 100 | **4** |
| **Total** | | | | | | **600** | **24** |

## POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VII

| Course | Course Code | Nomenclature of Discipline Specific Elective Course |
|---|---|---|
| DSE-H1 | B23-BBA-734 | Agri-Business Environment and Policy |
| DSE-H1 | B23-BBA-735 | Quality Management in Agribusiness |
| DSE-H1 | B23-BBA-736 | Contract Farming |

*Seminar would be assessed by a presentation based on relevant topic assigned to the student by the institute/collegeandevaluationofthesamewillbedonebytheatwomemberscommitteecomprisingofanexternalexpertfrom panelapprovedbyUGBOSofUniversitySchoolofManagement,KurukshetraUniversity,Kurukshetra andHeadof Department(orhis/hernominee)inconcernedcollege/institute.

## Fourth Year: Semester VIII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-831 | Agribusiness Financial Management | CC-H4 | 30 | 70 | - | 100 | **4** |
| B23-BBA-832 | Agricultural Marketing Management | CC-H5 | 30 | 70 | - | 100 | **4** |
| B23-BBA-833 | Livestock Business Management | CC-H6 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool ofdiscipline specific elective courses for Semester VIII | DSE-H2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-837 | Agri-Supply Chain Management | PC-H2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-838 | Comprehensive Viva-Voce | CC-HM2 | - | - | 100* | 100 | **4** |
| **Total** | | | | | | **600** | **24** |

### POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VIII

| Course | Course Code | Nomenclature of Discipline Specific Elective Course |
|---|---|---|
| DSE-H2 | B23-BBA-834 | International Agribusiness Trade |
| DSE-H2 | B23-BBA-835 | Microfinance for Agribusiness |
| DSE-H2 | B23-BBA-836 | Commodity Futures, Markets and Derivatives |

*****Comprehensive viva-voce would be conducted by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

**Note:** Student completing 180 credits would be eligible to obtain **Bachelor of Business Administration (Honours).**

# Bachelor of Business Administration (Honours with Research)

## C. Agri-Business

### Fourth Year: Semester VII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-731 | Agri-Business Entrepreneurship | CC-H1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-732 | Food Technology and Process Management | CC-H2 | 30 | 70 | - | 100 | **4** |
| B23-BBA-733 | Agri-Business Management | CC-H3 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool ofdiscipline specific elective courses for Semester VII | DSE-H1 | 30 | 70 | - | 100 | **4** |
| B23-BBA-737 | Seminar | PC-H1 | - | - | 100* | 100 | **4** |
| B23-BBA-738 | Management of Agribusiness Cooperatives | CC-HM1 | 30 | 70 | - | 100 | **4** |
| **Total** | | | | | | **600** | **24** |

### POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VII

| Course | Course Code | Nomenclature of Discipline Specific Elective Course |
|---|---|---|
| DSE-H1 | B23-BBA-734 | Agri-Business Environment and Policy |
| DSE-H1 | B23-BBA-735 | Quality Management in Agribusiness |
| DSE-H1 | B23-BBA-736 | Contract Farming |

*Seminar would be assessed by a presentation based on relevant topic assigned to the student by the institute/collegeandevaluationofthesamewillbedonebytheatwomemberscommitteecomprisingofanexternalexpertfrom panelapprovedbyUGBOSofUniversitySchoolofManagement,KurukshetraUniversity,Kurukshetra andHeadof Department(orhis/hernominee)inconcernedcollege/institute.

## Fourth Year: Semester VIII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BBA-831 | Agribusiness Financial Management | CC-H4 | 30 | 70 | - | 100 | **4** |
| B23-BBA-832 | Agricultural Marketing Management | CC-H5 | 30 | 70 | - | 100 | **4** |
| B23-BBA-838 | Comprehensive Viva-Voce | CC-HM2 | - | - | 100* | 100 | **4** |
| B23-BBA-839 | Research Project | Project/ Dissertation | 0 | 200** | 100*** | 300 | **8+4 =12** |
| **Total** | | | | | | **600** | **24** |

*Comprehensive viva-voce would be conducted by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

**ProjectReportwillbeevaluatedbyexternalexaminerfrompanelapprovedby UGBOSofUniversitySchoolofManagement,KurukshetraUniversity,Kurukshetra.

***Viva-VoceonProjectReportwillbeconductedbyExternalExaminerfrompanelapprovedbyUGBOSofUniversitySchoolofManagement,KurukshetraUniversity,Kurukshetra.

**Note:** Students completing 180 credits would be eligible to obtain **Bachelor of Business Administration (Honours with Research).**

## POOL OF MULTIDISCIPLINARY COURSES (MDC)

Multidisciplinary courses are based on introductory knowledge in a subject. These courses are offered to students of other discipline than discipline of business administration/management.

| Course Type | Course Code | Nomenclature of course | Credits | Contact Hours/Week | Internal Marks | End Term Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|---|---|
| MDC-1 | B23-BBA-105 | Social Media Marketing | 3 | 3 | 25 | 50 | 75 | 3 hrs. |
| MDC-2 | B23-BBA-206 | Entrepreneurship & Start-ups | 3 | 3 | 25 | 50 | 75 | 3 hrs. |
| MDC-3 | B23-BBA-306 | Fundamentals of Investing | 3 | 3 | 25 | 50 | 75 | 3 hrs. |

## POOL OF SKILL ENHANCEMENT COURSES (SEC)

| Course Type | Course Code | Nomenclature of course | Credits | Contact Hours/Week | Internal Marks | End Term Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|---|---|
| SEC-2 | B23-SEC-212 | Integrated Marketing Communications | 3 | 3 | 25 | 50 | 75 | 3 hrs. |
| SEC-2 | B23-SEC-214 | Business Communication | 3 | 3 | 25 | 50 | 75 | 3 hrs. |

## POOL OF VALUE ADDED COURSES (VAC)

| Course Type | Course Code | Nomenclature of course | Credits | Contact Hours/Week | Internal Marks | End Term Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|---|---|
| VAC-4 | B23-VAC-401 | Business Ethics | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| VAC-4 | B23-VAC-414 | Logistic Management | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| VAC-4 | B23-VAC-417 | E-Commerce | 2 | 2 | 15 | 35 | 50 | 3 hrs. |

## POOL OF VOCATIONAL COURSES (VOC)

| Course Type | Course Code | Nomenclature of course | Credits | Contact Hours/Week | Internal Marks | End Term Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|---|---|
| VOC-3 | B23-VOC-319 | Event Management | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| VOC-3 | B23-VOC-326 | Security Analysis and Portfolio Management | 4 | 4 | 30 | 70 | 100 | 3 hrs. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **I** | | |
| Name of the Course | **Financial Accounting** | | |
| Course Code | **B23-BBA-101** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-A1** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the accounting equations and the rules of recording accounting transactions.<br>2. Understand the recording of accounting transactions in the books of entry and the preparation of ledger accounts.<br>3. Understand the preparation of trial balance and reconciliation of accounting statements.<br>4. Analyze accounting transactions by preparing final accounts of statements for the profit and non-profit business entities.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Unit Basic Accounting-Nature, scope and objectives of accounting: accounting as information system, users of accounting information. Accounting equation: Accounting concepts and conventions, capital and revenue expenditure; Accounting principles, rules of accounting for recording the transaction for different accounts. | 15 |
| II | Journal and Ledger: Double Entry System; Journal and recording of entries in journal; Ledger- Posting from Journal to respective ledger accounts. Preparation of Cash book. | 15 |
| III | Trial Balance: Need and objectives; Preparation of Trial Balance; Different types of errors in preparation of trial balance and the rectification of errors. Preparation of Bank Reconciliation statement. | 15 |
| IV | Final Accounts: Preparation of Trading Account and Profit and Loss Account; Receipts and payments account, Preparation of Balance sheet for profit and non-profit organizations. | 15 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Gupta R. L.; *Advanced Accounting*; S. Chand & Sons.<br>2. Grewal T. S and M.C. Shukla; *Advanced Accounting;* S. Chand & Sons.<br>3. Williams, Haka, Bettner & Carcello; *Financial and Managerial Accounting;* McGraw Hill |

*Applicable for courses having practical component.

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **I** | | |
| Name of the Course | **Principles of Management** | | |
| Course Code | **B23-BBA-102** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-B1** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the Nature and Evolution of Management.<br>2. Apply the Managerial skills and roles at workplace.<br>3. Apprehend the functions of Management<br>4. Recognize the latest changes in the field of Management.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Management: Concept, Evolution of Management Thought, Functions, Significance, Managerial Roles & Skills; Planning and Decision Making: Concept, Planning Process, Components of Plans. | 15 |
| II | Organizing: Concept, Guiding Principles, Types of organizational structure: Line, Functional, Line & Staff relationship, Delegation of Authority: Meaning and elements of Delegation, Centralization Vs Decentralization. | 15 |
| III | Staffing – Nature and Meaning, Importance, Steps; Directing: Elements, Principles and Importance. | 15 |
| IV | Communication: Meaning, Process, Barriers, Corrective Measures; Communication networks, Controlling: Concept, Importance, Process of controlling, Control Techniques. | 15 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Koontz & Weirich. *Essentials of Management.* Tata McGraw Hill.<br>2. Kaul Vijay Kumar. *Business Organization & Management – Text and Cases*. Pearson.<br>3. Robbins. *Fundamentals of Management: Essentials Concept and Applications.* Pearson Education. |

*Applicable for courses having practical component.

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **I** | | |
| Name of the Course | **Business Organisation** | | |
| Course Code | **B23-BBA-103** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-C1** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the basic concepts in commerce, trade and industry.<br>2. Understand modern business practices, forms, procedures and functioning of various business organizations.<br>3. Understand the recent trends and practices in business world.<br>4. Understand the Government support and Community efforts.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Business Organisation: Meaning and nature, Objectives; Evolution; Forms/Types of Business Organisations; Partnership: Characteristics, Registration, Partnership Deed, Rights, Duties and Liabilities, Dissolution of Partnership. | 15 |
| II | Joint Stock Company-Concept, Characteristics, Types; Formation of Company; Multinational Companies; Conceptual Framework of Corporate Governance; One person Company. | 15 |
| III | Co-operative and State Ownership: Forms/Types; Non- Profit Organizations; Trade Associations; Emergence of Indian MNCs & transnational corporations-Recent trends business world. Globalization & challenges for Indian Business in new millennium. | 15 |
| IV | Setting up a New Enterprise Decisions in setting up an Enterprise – opportunity and idea generation, Role of creativity and innovation, Feasibility study and Business Plan, Business size and location decisions, various factors to be considered for starting a new unit, Relevant Government Policies - SEZ (Special Economic Zone) policy etc. | 15 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. C.R. Basu: *Business Organization and Management*; McGraw Hill.<br>2. P.C. Tulsian & Vishal Pandey: *Business Organization and Management*; Pearson.<br>3. Frank R. Mason: *Business Principles and Organization*; Forgotten Books.<br>4. S. A. Sherlekar: *Modern Business Organization*; Himalaya Publishing House.<br>5. Jallo: *Business Organization and Management*; Tata McGraw Hill.<br>6. Dr. V. Desai: *Organizing and Financing of Small Scale Industry*; Himalaya Publishing House.<br>7. Dr. C. B. Gupta: *Industrial Organization and Management*; Sultan Chand & Sons |

*Applicable for courses having practical component.

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **II** | | |
| Name of the Course | **Business Statistics** | | |
| Course Code | **B23-BBA-201** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-A2** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the meaning of the statistics and data in everyday life and its presentation for business decision making.<br>2. Understand distinctive features and characteristics of data with the help of descriptive and summary statistical measures.<br>3. Understand and analyses the departure from statistical normality of data for better business decision making.<br>4. Understand the significance of sampling in the statistical data collection and applications in business decision making.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Business Statistics: Introduction, Scope, Functions, Importance, Limitations; Distrust of Statistics; Collection of Primary and Secondary data; Types of Statistical Methods; Data Analysis and Interpretation; Graph: Characteristics, Types, Merits and Demerits. | 15 |
| II | Measures of Central Tendency: Meaning, Types; Arithmetic Mean; Geometric Mean; Harmonic Mean; Quadratic Mean; Moving Average; Progressive Average; Relation between Mean, Median and mode. | 15 |
| III | Measures of Dispersion and Skewness: Absolute and Relative measures of Dispersion range, Quartile deviation, Mean and Standard Deviation; Difference between Skewness and Dispersion, Empirical relation among various measures of Dispersion, Moments and Kurtosis. | 15 |
| IV | Sampling: Introduction, Census versus Sample, Errors in Sampling, Types of sampling, Judging reliability of sample; Index numbers: Introduction, Types of Index Numbers, Methods of constructing Index numbers, uses of Index numbers; Time Series analysis: Components and Seasonality analysis. | 15 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. D. N Elhance, Veena Elhance & BM Aggarwal. *Fundamentals of Statistics*. Kitab Mahal.<br>2. T.N Srivastava and Shailaja Rego. *Statistics for Management*. McGraw Hill.<br>3. S.C Gupta. *Fundamental of Statistics*. Himalaya Publishing House.<br>4. Levine & Rubin. *Statistics for Management*. Pearson Publication.<br>5. S.P Gupta. *Statistical Methods*. Sultan Chand & Sons. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **II** | | |
| Name of the Course | **Managerial Economics** | | |
| Course Code | **B23-BBA-202** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-B2** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the nature and scope of managerial economics and identify the role of economics in decision making.<br>2. Understand theory of demand, law of demand and cardinal utility analysis.<br>3. Understand theory of production, costs, and revenue function.<br>4. Understand theory of firm and market organization including determination of price under different market conditions.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Managerial Economics: Meaning, Nature and Scope. Objectives of the firm, Equilibrium, Utility, Opportunity cost, Marginal and Incremental Principles. | 15 |
| II | Theory of Demand: Nature of demand for a product, individual demand, market demand, determinants of demand, Law of demand, Elasticity of demand and its determinants; Theory of Consumer Behavior: Cardinal utility analysis, Indifference curve analysis, applications of Indifference curves. | 15 |
| III | Theory of Production and Costs: The concept of Production function, production with one and two variable inputs, theory of Cost in short run and long run, Revenue function. | 15 |
| IV | Theory of firm and market organization: Pricing under Perfect Competition, Pricing under Monopoly, Price Discrimination, Pricing under Monopolistic Competition, Selling cost, Pricing under Oligopoly. | 15 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Koutsoyiannis, A.: *Modern Microeconomics*; Palgrave Macmillan.<br>2. Varshney, R. L. and Maheshwari, K. L.: *Managerial Economics*; Sultan Chand & Sons.<br>3. Mote, V., Paul, S., and Gupta, G.: *Managerial Economics*; McGraw Hill Education. |

*Applicable for courses having practical component.

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **II** | | |
| Name of the Course | **Organisational Behaviour** | | |
| Course Code | **B23-BBA-203** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-C2** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the Nature, Evolution of Organisational Behaviour.<br>2. Understand the process of group formation and role of Groups at workplace.<br>3. Discover and Understand the concept of Motivation and Leadership theories<br>4. Comprehend the latest changes happening in the field of Organisational Behaviour.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Organizational Behaviour: Definition, Fundamental concepts of OB, Historical Background. | 15 |
| II | Motivation: Definition, Importance, Motives, Characteristics, Content Theories of Motivation Morale - Definition and relationship with productivity - Morale Indicators. | 15 |
| III | Theories of Leadership -Trait Theory, Behavioural theories, Contingency Theories, Transactional Theories and Transformational Leadership Theory. | 15 |
| IV | Group Dynamics and Team building: Concept of Group & Team. Theories of Group Formation – Types of Groups. Importance of Team building at workplace. | 15 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Robbins, S. P. and Sanghi. *Organizational Behaviour.* Pearson Education.<br>2. Robbins, S. P. and Judge T. A. Vohra; *Organisational Behaviour.*Pearson Education. |

*Applicable for courses having practical component.

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **III** | | |
| Name of the Course | **Managerial Accounting** | | |
| Course Code | **B23-BBA-301** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-A3** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the fundamentals of management/managerial accounting and effective decision making through management accounting.<br>2. Understand the application of marginal costing and break-even analysis for decision making in business<br>3. Learn budgeting process and types of budgets for effective planning.<br>4. Learn decision making through financial analysis and management control systems.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Managerial Accounting: Nature, scope, functions and significance. Distinction between management accounting and financial accounting. Decision making through management accounting. | 15 |
| II | Marginal Costing: Nature, Significance and Limitations. CVP Analysis and Break-even analysis. Marginal costing as decision making tool. Distinction between Marginal Costing and Standard Costing. | 15 |
| III | Budgeting Process; Performance Budgeting, Zero base budgeting, Programme budgeting and Activity based budgeting. Budgetary control: Nature, objectives and significance. Types of Budgets: Operational Budgets, Financial budgets and Master Budget. | 15 |
| IV | Responsibility accounting and centres, management control systems, Financial Analysis: Nature and tools; Ratio Analysis: Meaning and Significance. Decisions through financial analysis. | 15 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Rajesh Kothari, 'Management Accounting- concepts and applications, MacMillan India Ltd., 2007.<br>2. S. N. Maheshwari, S. K. Mahaeshwari, 'Accounting for Management, Vikas Publishing House Pvt. Ltd., 2006.<br>3. M. A. Sahaf, 'Management Accounting- Principles and Practice' Vikas Publishing House |

*Applicable for courses having practical component.

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **III** | | |
| Name of the Course | **Marketing Management** | | |
| Course Code | **B23-BBA-302** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-B3** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Describe the fundamental concept related to marketing<br>2. Describe the different approach of marketing and environment in which marketing system operate.<br>3. Demonstrate an understanding of the 4P's used by marketers.<br>4. Design a marketing plan for real world market offering (product/service).<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course |
|---|
| **<u>Instructions for Paper- Setter</u>**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two |

parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Marketing Management- Meaning, Nature and Scope. Concepts of Marketing, Marketing Environment, Marketing Mix, STP (segmenting, targeting and positioning) approach to marketing. | 15 |
| II | Marketing Information System- Meaning and Components. Marketing Research. Consumer Behaviour-Meaning and Importance of study for Marketers. | 15 |
| III | Product —Meaning, levels and product Mix. New Product development, Product Life Cycle, Branding and Packaging decision, Pricing-Meaning, procedure for setting a price, Pricing Strategy Distribution Channels- Levels and Roles. Management of Physical Distribution. | 15 |
| IV | Promotion- promotion Mix- A study of advertising, sales promotion, personal selling, direct marketing and public relations. Marketing organization and control, Marketing of Services: An introduction to services, Role of Service Sector in the economy, 7P's of Service Marketing. | 15 |
| V* | | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. Kotler, P. & Keller, K.: *Marketing Management*, 16th ed.; Pearson Publisher, New Delhi.
2. Ramaswamy, V.S. and Namakumari, S.: *Marketing Management: Planning, Control*; MacMillan Press, New Delhi.
3. Saxena, R.: *Marketing Management*, 6th ed.; Tata Mc. Graw Hill, New Delhi.


*Applicable for courses having practical component.

**Part A - Introduction**

| | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **III** | | |
| Name of the Course | **Human Resource Management** | | |
| Course Code | **B23-BBA-303** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-C3** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. To familiarize students with the concept of Human resource management.<br>2. To understand the role and competencies required for Human resource Managers in an organization.<br>3. To help students understand the various aspects of employee life cycle within an organization.<br>4. To significantly improve the understanding of students about global HR Practices.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| **Part B- Contents of the Course** |
|---|

**Instructions for Paper- Setter**

The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Human Resource Management-An Introduction; Human Resource Planning; Recruitment and Selection | 15 |
| II | Training and Development: Methods of Training; Job Analysis; Job Evaluation; Career Planning | 15 |
| III | Performance Management; Payroll and Compensation Management; Employee Retention; Employee Health and Safety; Mental Health and Wellbeing | 15 |
| IV | Recent trends in Human resource Management; Impact of technology on HRM; International HRM practices | 15 |
| V* | | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. K. Aswathapa: *Human Resource Management: Text and Cases*; Tata McGraw Hill, New Delhi.
2. P. Jyothi: *Human Resource Management*; Oxford University Press.
3. V.S.P. Rao: *Human Resource Management*; Himalaya Publication House.
4. Seema Sanghi: *Human Resource Management*; Macmillan India Publication.


*Applicable for courses having practical component.

**Part A - Introduction**

| | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **IV** | | |
| Name of the Course | **Capital Markets** | | |
| Course Code | **B23-BBA-401** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-A4** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand regulatory framework of capital markets.<br>2. Understand the role of primary and secondary capital markets.<br>3. Understand depository system across the global capital markets<br>4. Understand the role of development banks and financial institution in India.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| **Part B- Contents of the Course** |
|---|

**Instructions for Paper- Setter**

The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Capital Markets - meaning, nature, role and features; recent reforms in the capital markets across the world; regulatory framework of Indian capital market; capital market instruments; innovation in financial instruments. | 15 |
| II | Primary capital market - scenario in India, primary capital market intermediaries, primary market activities, methods of raising resources from primary market; secondary capital market - scenario in India, reforms in secondary market; organization and management, trading and settlement, listing of securities; stock market index; Role of SEBI to increase liquidity in the stock market. | 15 |
| III | Depository system - meaning, need and benefits of depository system in India; depository process, functioning of NSDL and SHCIL; importance of debt market in capital market; participants in the debt market, types of instrument treated in the debt market, primary and secondary segments of debt market. | 15 |
| IV | Role and policy measures relating to development banks and financial institution in India, products and services offered by IFCI, IDBI, IIBI, SIDBI, IDFCL, EXIM Bank, NABARD and ICICI Meaning and benefits of mutual funds, types of mutual funds, SEBI guidelines relating to mutual funds. | 15 |
| V* | | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. Pathak, Bharati V. *The Indian Financial System.* Pearson Education
2. Khan, M. Y. *Indian Financial System.* Tata McGraw Hill
3. Bhole, L M. *Financial Institutions and Markets*. Tata McGraw Hill

*Applicable for courses having practical component.

**Part A - Introduction**

| | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **IV** | | |
| Name of the Course | **Business Research Methods** | | |
| Course Code | **B23-BBA-402** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-B4** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Provide an exposure pertaining to the nature and extent of research orientation and give an understanding of the components, concept, constructs, and variables.<br>2. Provide an understanding of the research design and measurement scales.<br>3. Provide an understanding of the sample design.<br>4. Provide an understanding of the basic techniques and tools of business research.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| **Part B- Contents of the Course** |
|---|

**Instructions for Paper- Setter**

The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Business Research – Meaning, Types, Managerial value of Business Research; Theory and Research – Components, Concept, Constructs, variables, Proposition and Hypothesis, Deductive and Inductive theory; Nature, Process and Importance of Problem Definition; Purpose and types of Research Proposal, Ingredients of Research Proposal. | 15 |
| II | Research Design – Meaning, Classification and Elements of Research Design; Methods and categories of Exploratory Research; basic issues in Experimental Design, classification of Experimental Design; Concept and their measurement, Measurement Scales. | 15 |
| III | Sample Design and Sampling Procedure, Determination of Sample Size; Research Methods of collecting Primary data; and Issues in construction of Questionnaire. | 15 |
| IV | Statistical techniques of Data Analysis; Nature and Types of Descriptive Analysis, Univariate and Bivariate tests of Statistical Significance; Meaning and Types of Research Report, Ingredients of Research Report. | 15 |
| V* | | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. Cooper, D., Schindler, P., and Sharma, J. K. *Business Research Methods*. McGraw Hill Education.
2. Bajpai, N. *Business Research Methods*. Pearson Education.
3. Zikmund, William G., Babin, Barry J., Carr, Jon C., and Griffin, M. *Business Research Methods*. Cengage India Private Limited.


*Applicable for courses having practical component.

**Part A - Introduction**

| | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **IV** | | |
| Name of the Course | **Business Environment** | | |
| Course Code | **B23-BBA-403** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-C4** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Develop an understanding of Business environment and the factors influencing it.<br>2. Comprehend the various micro and macro environmental forces and economic systems<br>3. Understand the current business ecosystem, its dynamics and possible future outlook of Indian business ecosystem.<br>4. Make themselves future ready concerning availing opportunities and overcoming threats present in business ecosystem.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| **Part B- Contents of the Course** |
|---|

**Instructions for Paper- Setter**

The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Business environment: Concept, Nature and Significance; Economic, Social, Political forces affecting business operations & growth. Digital disruptions and transformations of businesses: Micro risk analysis. | 15 |
| II | Types of Business Environment, Environmental Scanning, Risk in Business Environment: Country risk and Political risk; SWOT Analysis and Political Risk Management; Economic systems: Capitalism, Socialism & Mixed economy. | 15 |
| III | Economic Planning in India: Objectives, Strategy and Problems; Impact of Economic Planning in India; Economic roles of Government: Regulatory role, Promotional role, Entrepreneurial role, Planning role, Economic role in Indian context; The Constitutional Environment and State intervention in business. | 15 |
| IV | Social Responsibility of business: Concept, Rationale, Dimensions and its disclosure by Indian business; Professionalisation and business ethics. Competitive Environment of business with reference to Competition Commission of India (CCI) and Competition Act. | 15 |
| V* | | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Daniel, J. D. and Radebangh, L. H.: *International Business*; Addison Wesley Publishing Company.<br>2. Sundram, K. P. M., Datt, G., and Mahajan, A.: *Indian Economy*; S Chand.<br>3. Aswathapa, K.: *Business Environment*; Excel Books.<br>4. Bedi, S. K.: *Business Environment*; Excel Books.<br>5. Paul: *Business Environment Text and Cases*; McGraw Hill Education. |

*Applicable for courses having practical component.

| Part A - Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **I** | | |
| Name of the Course | **Business Mathematics-I** | | |
| Course Code | **B23-BBA-104** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-M1** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand set theory, logical statements and truth table. Find the solution of linear equations.<br>2. Determine the solution of quadratic equations. Learn the concept and applications of permutations and combinations.<br>3. Apply binomial theorem. Understand the concepts related to functions, limit and continuity and appropriately apply the concepts of differential calculus to solve related problems.<br>4. Understand the matrix algebra and its application to business problems. Find the solution of system of simultaneous linear equations using determinants and matrices.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **2** | **0** | **2** |
| Contact Hours/Week | **2** | **0** | **2** |
| Max. Marks: **50**<br>Internal Assessment Marks: **15**<br>End Term Exam Marks: **35** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 1.75 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 7 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Set Theory: Representation of sets, equivalent sets, power set, complement of a set. Venn Diagrams: Union and Intersection of sets, De-Morgan's laws. | 8 |
| II | Quadratic Equations with real roots: Relations between roots and coefficient of the quadratic equations , Methods of solving a quadratic equation | 8 |
| III | Binomial Theorem (positive index). Functions, Limits and Continuity. | 7 |
| IV | Matrix System: Matrices, Basic operations on matrices (Addition, Multiplication, Transpose), Determinant of a square matrix, Inverse of a square matrix, Cramer's rule | 7 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **4**<br>● Seminar/presentation/assignment/quiz/class test etc.: **4**<br>● Mid-Term Exam: **7**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **35** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Dr. Sancheti & Kapoor: *Business Mathematics and Statistics*; Sultan Chand.<br>2. R.S. Bhardwaj: *Mathematics for Economics & Business*; Excel Books, India.<br>3. M. Raghavachari: *Mathematics for Management: An Introduction*; Tata McGraw Hills.<br>4. Azharuddin: *Business Mathematics*; Vikas Publishers.<br>5. Gorakh Prasad: *Differential Calculus*; Rashi Kansal (Pothishala).<br>6. G. Rangaraj, R. Mallieswari & V. Rema: *Business Mathematics*; Cengage.<br>7. Eugene Don, Joel Lerner: *Schaum's Outline of Basic Business Mathematics (Schaum's Outlines)*; McGraw-Hill Education. |

*Applicable for courses having practical component.

| Part A - Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **II** | | |
| Name of the Course | **Business Mathematics-II** | | |
| Course Code | **B23-BBA-204** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-M2** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the application of Average, Ratio and Proportion, Percentage, Profit and Loss, Commission, Discount, Broke in business organisation.<br>2. Understand simple interest and compound interest and annuities.<br>3. Understand indices & logarithms.<br>4. Understand applications of linear programming in solving business problems.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **2** | **0** | **2** |
| Contact Hours/Week | **2** | **0** | **2** |
| Max. Marks: **50**<br>Internal Assessment Marks: **15**<br>End Term Exam Marks: **35** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 1.75 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 7 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Average, Ratio and Proportion, Percentage, Profit and Loss, Commission, Discount, Broke. | 8 |
| II | Simple interest and compound interest. Annuities: Types of annuities, Present value and amount of an annuity (including the case of continuous compounding), Valuation of simple loans and debentures, Problems related to sinking funds. | 8 |
| III | Indices & logarithms, arithmetic and geometric progressions and their business applications; sum of first n natural numbers, sum of squares and cubes of first n natural numbers. | 7 |
| IV | Linear Programming: Formulation of linear programming problems (LPP) and their solution by graphical and simplex methods. Applications of linear programming in solving business problems. | 7 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **4**<br>● Seminar/presentation/assignment/quiz/class test etc.: **4**<br>● Mid-Term Exam: **7**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **35** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br>8. E. Don and J. Lerner (2009). Schaum's outline of Basic Business Mathematics (2nd Edition). McGraw Hill.<br>9. L.N.Paul (2002). Linear Programming: an introductory analysis. Tata Mcgraw Hill. New. |

*Applicable for courses having practical component.

| Part A - Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **III** | | |
| Name of the Course | **Production Management** | | |
| Course Code | **B23-BBA-304** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-M3** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the nature and importance of production management and decision making in production function.<br>2. Obtain an understanding of production planning and control practice in organizations and various methods of production<br>3. Understand inventory management techniques, store management and its functions.<br>4. Gain an in-depth knowledge of ISO certification and Statistical Quality Control in Production.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Production Management: Meaning, nature objectives and functions of Production Management, scope of Production Management; Historical background of Production Management; Types of Production System: intermittent and continuous; Emerging trends in Production Management. | 15 |
| II | Productivity; Plant location and its factor affecting plant location; Plant layout, types of plant layout: process, product and fixed layout. | 15 |
| III | Product design, steps in product design; Process planning and selection; Make or buy decisions; Purchase Management, purchasing cycle; Maintenance Management. | 15 |
| IV | Production Planning and Control; Inventory Management and control, inventory control techniques: ABC Analysis, XYZ Analysis, VED Analysis, FSN Analysis, SDE Analysis; Quality control in production. | 15 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. K. Aswathappa and K. Shridhara Bhat: *Production and Operations Management*; Himalaya Publishing House.<br>2. S. N. Chary: *Production and Operations Management*; Tata McGraw Hill.<br>3. Richard B. Chase, Jacobs, Aquilano, and Aggarwal: *Operations Management*; The McGraw Hill.<br>4. Faizer: *Operations Management*; Cengage Publications.<br>5. Chunawalla: *Production and Operation Management*; Himalaya Publishing House. |

*Applicable for courses having practical component.

| Part A - Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **III** | | |
| Name of the Course | **Disaster Management** | | |
| Course Code | **B23-BBA-305** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-M3** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Comprehend the basic conceptual understanding of disasters.<br>2. Understand approaches of Disaster Management.<br>3. Differentiate between natural and Man Made disasters.<br>4. Build skills to respond to disaster.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Disaster: Meaning and Nature, Concept of Hazard, Risk and Vulnerability, Types of Disaster: Natural Disaster, Flood, Cyclone, Earthquakes, And Landslides etc. | 15 |
| II | Man-made Disaster: Fire, Industrial Pollution, Nuclear Disaster, Biological Disasters, Accidents (Air, Sea, Rail & Road), Structural failures (Building and Bridge), War & Terrorism etc. | 15 |
| III | Disaster Management; (Concept & significance), Planning, Coordination, leadership and control, Pre-Disaster Preparation, Handling Disaster, Post-disaster – Damage and Needs Assessment. | 15 |
| IV | Institutional Framework of Disaster Management in India, Stakeholders in Disaster Management, National Management, Disaster Management Policy of India. | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Anu Kapur & others: *Disasters in India: Studies of Grim Reality*; 2005; Rawat Publishers, Jaipur; 283 pages.<br>2. Disaster Management Act 2005, Publisher: Govt. of India.<br>3. National Disaster Management Policy; 2009; Govt. of India.<br>4. Dr. Mrinalini Pandey: *Disaster Management*; Wiley India Pvt. Ltd.<br>5. Tushar Bhattacharya: *Disaster Science and Management*, 1st Edition; McGraw-Hill Education (India) Private Limited. |

## POOL OF MULTIDISCIPLINARY COURSES (MDC)

Multidisciplinary courses are based on introductory knowledge in a subject. These courses are offered to students of other discipline than discipline of business administration/management.

| Course Type | Course Code | Nomenclature of course | Credits | Contact Hours/Week | Internal Marks | End Term Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|---|---|
| MDC-1 | B23-BBA-105 | Social Media Marketing | 3 | 3 | 25 | 50 | 75 | 3 hrs. |
| MDC-2 | B23-BBA-206 | Entrepreneurship & Start-ups | 3 | 3 | 25 | 50 | 75 | 3 hrs. |
| MDC-3 | B23-BBA-306 | Fundamentals of Investing | 3 | 3 | 25 | 50 | 75 | 3 hrs. |

| Part A - Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **I** | | |
| Name of the Course | **Social Media Marketing** | | |
| Course Code | **B23-BBA-105** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **MDC-1** | | |
| Level of the course (As per Annexure-I | **Introductory-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the significance and challenges of social media marketing.<br>2. Develop a comprehensive social media marketing strategy.<br>3. Create and manage engaging social media content.<br>4. Utilize social media advertising tools and analyze campaign performance.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **3** | **0** | **3** |
| Contact Hours/Week | **3** | **0** | **3** |
| Max. Marks: **75**<br>Internal Assessment Marks: **25**<br>End Term Exam Marks: **50** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 2.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 10 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Social Media Marketing: Meaning and significance in modern era; Impact of social media platforms- Facebook, LinkedIn, Twitter, Instagram, Pinterest, and YouTube on Marketing endeavours; Problems associated with Social Media Marketing. | 12 |
| II | Social Media Planning: Social media goals and objectives; Audience analysis; Developing social media marketing strategy; Social media control; Integrating marketing strategy with social media marketing strategy. | 11 |
| III | Social Media Content: Content Creation, Audience Engagement; Content Scheduling; Content Management and Control. | 11 |
| IV | Social Media Advertising and Analytics: Tools for social media Advertising; Planning and executing social media campaigns; An Overview of social media analytics tools. | 11 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **05**<br>● Seminar/presentation/assignment/quiz/class test etc.: **07**<br>● Mid-Term Exam: **13**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **50** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Sameer Deshpande, Philip Kotler, Nancy R. Lee; *Social Marketing in India*; Pearson Publication<br>2. Jason McDonald; *Social Media Marketing Workbook*<br>3. Linda Coles; *Marketing with Social Media*; Pearson Publication<br>4. Dan Zarrella; *The Social Media Marketing Book*; Pearson Publication<br>5. Michael R. Solomon, Tracy Tuten; *Social Media Marketing*; Pearson Publication<br>6. Guy Kawasaki, Peg Fitzpatrick; *The Art of Social Media: Power Tips for Power Users*; Pearson Publication. |

*Applicable for courses having practical component.

| Part A - Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **II** | | |
| Name of the Course | **Entrepreneurship & Start-ups** | | |
| Course Code | **B23-BBA-206** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **MDC-2** | | |
| Level of the course (As per Annexure-I | **Introductory-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the concept of Entrepreneur and Entrepreneurship.<br>2. Role of Institutions in promotion of Entrepreneurship culture.<br>3. Government Support for the startups.<br>4. Various stakeholders involved in a startup.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **3** | **0** | **3** |
| Contact Hours/Week | **3** | **0** | **3** |
| Max. Marks: **75**<br>Internal Assessment Marks: **25**<br>End Term Exam Marks: **50** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 2.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 10 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Entrepreneurship: Meaning and Significance, Relationship between Entrepreneurship Development and Economic Development, Qualities of entrepreneurs and Entrepreneurial Competencies, Types of Entrepreneurs. | 12 |
| II | Entrepreneurial support system; Family Business and their contribution to Entrepreneurship Role of Educational Institutions in promoting the Entrepreneurship culture | 11 |
| III | Role of Government, Promotional Agencies and Institutions in Entrepreneurship Development, Incentives and Various Financial Schemes available for Entrepreneurs. | 11 |
| IV | Opportunity Identification process; Business plan, Start-Up India Initiative Major Players/stakeholders in Startup Ecosystem – Mentors, Incubators, Investors, Accelerators, Government Bodies. | 11 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **05**<br>● Seminar/presentation/assignment/quiz/class test etc.: **07**<br>● Mid-Term Exam: **13**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **50** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Kumar, Arya (2012); *Entrepreneurship*, Pearson, New Delhi.<br>2. Shukla, MB, (2011), *Entrepreneurship and Small Business Management*, Kitab Mahal, Allahabad.<br>3. Sahay A., A. Nirjar (2006), *Entrepreneurship: Education, Theory and Practice*, Excel Books, New Delhi.<br>4. Panda S.C. (2008) *Entrepreneurship Development*. Anmol Publications. |

*Applicable for courses having practical component.

| Part A - Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **II** | | |
| Name of the Course | **Fundamentals of Investing** | | |
| Course Code | **B23-BBA-306** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **MDC-3** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand different investment avenues and their characteristics.<br>2. Gain knowledge about the functioning of the Indian Securities Market and the role of SEBI.<br>3. Analyze the relationship between returns and risks in financial investments.<br>4. Recognize the significance of depositories in securities transactions and investor protection measures.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **3** | **0** | **3** |
| Contact Hours/Week | **3** | **0** | **3** |
| Max. Marks: **75**<br>Internal Assessment Marks: **25**<br>End Term Exam Marks: **50** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 2.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 10 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Investment avenues-money market and capital market instruments, Investment process, Objectives of investment. | 12 |
| II | Indian Securities Market, Process of investing through stock exchange, Stock Market Indices, NEAT System, BOLT System, Role of SEBI. | 11 |
| III | Returns and Risks in financial investment, Fixed-Income Securities and variable income securities, Bonds and Mutual funds and role of AMFI. | 11 |
| IV | Role of Depositories in India, Investor Protection in India, Rights and Duties of Investors. | 11 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **05**<br>● Seminar/presentation/assignment/quiz/class test etc.: **07**<br>● Mid-Term Exam: **13**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **50** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Vanita Tripathi*; Fundamentals of Investments;* Taxmann Publication.<br>2. M. Madan Mohan, S. Brinda, V. Ravi; *Investment Management; Himalaya Publication House*.<br>3. Rajiv Srivastava; *Investment Management;* Wiley Publication.<br>4. *R. B. Maheshwari; Investment Management;* Sahitya Bhawan<br>5. *R. P. Rustagi, Investment Management: Theory and Practice;* Sultan Chand & Sons. |

*Applicable for courses having practical component.

## POOL OF SKILL ENHANCEMENT COURSES (SEC)

| Course Type | Course Code | Nomenclature of course | Credits | Contact Hours/Week | Internal Marks | End Term Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|---|---|
| SEC-2 | B23-SEC-212 | Integrated Marketing Communications | 3 | 3 | 25 | 50 | 75 | 3 hrs. |
| SEC-2 | B23-SEC-214 | Business Communication | 3 | 3 | 25 | 50 | 75 | 3 hrs. |

| Part A - Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **II** | | |
| Name of the Course | **Integrated Marketing Communication** | | |
| Course Code | **B23-SEC-212** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **SEC-2** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1 To define various terms associated with the field of integrated marketing communication.<br>2. To explain the components of integrated marketing communication.<br>3. To distinguish the utility of various promotional tools.<br>4. To evaluate the effectiveness of marketing communicationstrategy._____<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **3** | **0** | **3** |
| Contact Hours/Week | **3** | **0** | **3** |
| Max. Marks: **75**<br>Internal Assessment Marks: **25**<br>End Term Exam Marks: **50** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 2.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 10 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction – Concept of Marketing Communication, Marketing communication mix, Factor affecting marketing communication mix, Drivers of integrated marketing mix | 12 |
| II | Managing the Marketing Communication Process – Analysis of promotional opportunities, Concepts of segmentation and target marketing, Promotional strategy of formulation and competitive positioning. | 11 |
| III | Advertising and Media Planning – Advertising plan, creative strategy, Advertising appeal, Creative formats, Stages of creative strategy – Idea generation, copy writing, layout, copy testing and diagnosis | 11 |
| IV | Wider Issues and Dimensions – Sales promotions, Personal selling, direct marketing, Public relations, Publicity and corporate advertising, Unconventional promotional media. | 11 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **05**<br>● Seminar/presentation/assignment/quiz/class test etc.: **07**<br>● Mid-Term Exam: **13**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **50** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Blakeman, R. Integrated Marketing Communication: Creative Strategy from Idea to Implementation, Rowman & Littlefield<br>2. Dutta, K., Integrated Marketing Communication, Oxford Higher Education<br>3. Belch, G. E., Belch, M. A. and Purani, K., Advertising and Promotion, McGraw Hill Education. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **II** | | |
| Name of the Course | **Business Communication** | | |
| Course Code | **B23-SEC-214** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **SEC-2** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. To define and outline all four business communication skills i.e. reading, writing, speaking and listening<br>2. To apply and demonstrate the gathered knowledge about the business communication regarding both inter and intra organizational situations<br>3. To distinguish and examine the necessary techniques and skills that help them in communicating effectively for handling organizational issues.<br>4. To design and develop their methods and ways in transmitting information within and outside the organizations in the most effective manner.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **3** | **0** | **3** |
| Contact Hours/Week | **3** | **0** | **3** |
| Max. Marks: **75**<br>Internal Assessment Marks: **25**<br>End Term Exam Marks: **50** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 2.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 10 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to the Communication: Meaning, Nature, scope and Process of communication, Importance of Effective Business Communication, Objectives of Business Communication, Types/Pattern of Business Communication; Media/Channels of Business Communication; Barriers to Business Communication. | 12 |
| II | Written Communication- (a) Business Letter Writing, (b) Business Report Writing: Importance, Need, Types, Techniques, Language, Structure, Planning and Drafting Written Communication; Preparing Official Communication, Circular, Notification, Amendment, Press Communiqué, DO letter, Telegram. | 11 |
| III | Oral Communication: Interviewing-Art of effective interviewing, Types of Interviewing, Techniques of Interviewing, Qualities of Interviewer and Interviewer, Planning of Interviewing, Process of Interviewing. Communicating within groups. | 11 |
| IV | Audio visual Communication: Role of Audio-Visual Communication, Channels of Audio-Visual Communication, Importance of Body language in non-verbal communication; Role of Public Relation in Business Communication | 11 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **05**<br>● Seminar/presentation/assignment/quiz/class test etc.: **07**<br>● Mid-Term Exam: **13**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **50** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Murty, C.V.S., Rai, Urmila and S.M. Rai, Business Communication, Himalaya Publishing House, Mumbai.<br>2. Koneru, Arun, Professional Communication, Tata McGraw Hill, New Delhi.<br>3. Monipally, M.M., Business Communication Strategies, Tata McGraw Hill, New Delhi. |

## POOL OF VALUE ADDED COURSES (VAC)

| Course Type | Course Code | Nomenclature of course | Credits | Contact Hours/Week | Internal Marks | End Term Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|---|---|
| VAC-4 | B23-VAC-401 | Business Ethics | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| VAC-4 | B23-VAC-414 | Logistic Management | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| VAC-4 | B23-VAC-417 | E-Commerce | 2 | 2 | 15 | 35 | 50 | 3 hrs. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **IV** | | |
| Name of the Course | **Business Ethics** | | |
| Course Code | **B23-VAC-401** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **VAC-4** | | |
| Level of the course (As per Annexure-I | **Intermediate** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. To Identify and apply ethical principles to human decision typical of business as a result of reading course texts and participating in lecture presentation and class discussion.<br>2. To Enhance analytical skill of ethical position taken on these matters and formulate morale defenses of decisions by completing course activities.<br>3. To Embrace value system in decision making.<br>4. To Recognize organizational challenges to ethical behavior and ethical dilemma resolution process.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **2** | **0** | **2** |
| Contact Hours/Week | **2** | **0** | **2** |
| Max. Marks: **50**<br>Internal Assessment Marks: **15**<br>End Term Exam Marks: **35** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 1.75 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 7 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Business Ethics: An Overview, Ethics and Morals, Need for Business Ethics, Types of Ethics, Benefits of Business Ethics, Principles of Business Ethics, Factors affecting Business Ethics | 8 |
| II | Organisational Ethics: Introduction, Ethical Corporate Behaviour, Development of Ethical Corporate behaviour, Ethical Leadership; Concept of Morals, Values; Moral issues in business; Ethical Dilemmas in Organisation | 8 |
| III | Workplace Ethics: Introduction, Factors affecting Ethical Behavior at work; Ethical Issue: Business Relationships, Conflicts of Interest, Fairness and Honesty, Communications, Discrimination, Harassment; Role of Business Ethics in building a good society. | 7 |
| IV | Ethical Issues in the Functional Area-Ethics in Marketing, Finance, HR, Production and Information Technology; Gender Ethics. | 7 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **4**<br>● Seminar/presentation/assignment/quiz/class test etc.: **4**<br>● Mid-Term Exam: **7**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **35** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Sharma Subash; *New Mantras in Corporate Corridors*; New age International Publishers.<br>2. Sadri S., Jayashree; *Business Ethics and Corporate Governance (towards excellence and sustainability)*; Himalaya Publishing House.<br>3. Manuel G Velasquez; *Business ethics - concepts and cases*; Pearsons.<br>4. Chakraborty S.K.; *Management by Values*; Oxford. R. Subramanian; *Professional Ethics*; OXFORD.<br>5. Jayashree S. Sadri S. and Dastoor D.S.; *Theory and Practice of Managerial Ethics*; Jaico. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **IV** | | |
| Name of the Course | **Logistic Management** | | |
| Course Code | **B23-VAC-414** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **VAC-4** | | |
| Level of the course (As per Annexure-I | **Intermediate Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. To give insight about logistic management.<br>2. To outline key logistic management concepts and its application to market.<br>3. To analyse and examine the implementation of logistic management concepts and strategy to firms.<br>4. To attain organisational goals using logistic management techniques in proper way.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **2** | **0** | **2** |
| Contact Hours/Week | **2** | **0** | **2** |
| Max. Marks: **50**<br>Internal Assessment Marks: **15**<br>End Term Exam Marks: **35** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 1.75 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 7 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction of Logistic Management: Definition, Objectives, Components, Significance, Role of Logistic Management, Use of IT in Logistic, Logistics Management: Logistical operation, Integration, Logistical performance cycle, Customer service global logistics, Logistical resources (Information & Forecasting) | 8 |
| II | Warehouse and Transport Management: Concept of strategic storage, Warehouse functionality, Warehouse operating, Material handling and packaging in warehouse, Types of Warehouses, Transportation management, Transport functionality and principles, Transport Infrastructure, Transport decision making | 8 |
| III | Wider Issues and Dimensions – Sales promotions, Personal selling, Direct marketing, Public relations, Publicity and corporate advertising, unconventional promotional media. | 7 |
| IV | Inventory Management: Introduction, Basic Concepts of Inventory, Classification of Inventory, Concept of EOQ (Including examples), Material planning and Controlling Techniques (ABC Analysis, FSN, VED, HML Analysis) | 7 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **4**<br>● Seminar/presentation/assignment/quiz/class test etc.: **4**<br>● Mid-Term Exam: **7**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **35** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>4. Stern, Louis W. Adel, I.E.L. – Ansary, Annee T. Coughlan: Marketing Channels,Prentice Hall, New Delhi.<br>5. Ballu, Ronald H, Business Logistics Management, Englewood Cliffs, New York, Prentice Hall Inc.<br>6. Martin, Christopher and Gordon Wills: Marketing Logistics and Distribution Management<br>7. Khanna, K.K. Physical Distribution Management, Himalaya Publishing House, New Delhi.<br>8. Lambert, D. et. al., Strategic Logistics Management, Tata McGraw Hill, New Delhi. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **IV** | | |
| Name of the Course | **E-Commerce** | | |
| Course Code | **B23-VAC-417** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **VAC-4** | | |
| Level of the course (As per Annexure-I | **Intermediate Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. To describe the foundation and importance of E - Commerce.<br>2. To compare the different electronic payment system.<br>3. To create business model and strategy for online business.<br>4. To select the infrastructure for E-Commerce.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **2** | **0** | **2** |
| Contact Hours | **2** | **0** | **2** |
| Max. Marks: **50**<br>Internal Assessment Marks: **15**<br>End Term Exam Marks: **35** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 1.75 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 7 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction – Meaning, Nature, Concepts, Advantages and reasons for transacting online, Categories of e-commerce; Planning Online Business: nature and dynamics of the internet, pure online vs. brick and click business. | 8 |
| II | Technology for Online Business – internet, IT infrastructure; middleware contents: text and integrating e-business applications; mechanism of making payment through internet: online payment mechanism, electronic payment systems, payment gateways. | 8 |
| III | Applications in e-commerce – e-commerce applications in manufacturing, wholesale, retail and service sector. | 7 |
| IV | Virtual Existence – Concepts, working, advantages and pitfalls of virtual organizations, Security in e-commerce: digital signatures, network security, data encryption secret keys, data encryption. | 7 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **4**<br>● Seminar/presentation/assignment/quiz/class test etc.: **4**<br>● Mid-Term Exam: **7**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **35** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Murty, C.V.S., E-Commerce, Himalaya Publications, New Delhi<br>2. Kienam, Managing Your E-Commerce business, Prentice Hall of India, N.Delhi.<br>3. Kosiur, Understanding E-Commerce, Prentice Hall of India, N.Delhi.<br>4. Kalakota, Whinston, Frontiers of Electronic Commerce, Addison Wesley |

## POOL OF VOCATIONAL COURSES (VOC)

| Course Type | Course Code | Nomenclature of course | Credits | Contact Hours/Week | Internal Marks | End Term Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|---|---|
| VOC-3 | B23-VOC-319 | Event Management | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| VOC-3 | B23-VOC-326 | Security Analysis and Portfolio Management | 4 | 4 | 30 | 70 | 100 | 3 hrs. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **VI** | | |
| Name of the Course | **Event Management** | | |
| Course Code | **B23-VOC-319** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **VOC-3** | | |
| Level of the course (As per Annexure-I | **Intermediate Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. To give insight about event management.<br>2. To outline key event management concepts and its application to market.<br>3. To analyse and examine the implementation of event management concepts and strategy to firms.<br>4. Attainment of organisational goals using event management techniques in proper way.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Event Planning and Control : Introduction to event planning and management, Event Production, Role of event planner and qualities of good planner, Importance of organising events and its components, Techniques, Selection, Coordination, Creativity, Designing, Marketing, sponsorship, Production of special corporate and sports events | 15 |
| II | Legal Aspects of Business: Introduction to legal components of event management, Relevant Legislation, Contract Agreement Act, Company and Business Law, Sales Act, Indian Partnership Act, Negotiable Instrument Act. | 15 |
| III | IT in Event Management: Hardware and Software, Data Processing System, Input-Output devices, Storage devices, Word processing software such as Microsoft Word processing- Level -1 Micro Computer operation and operating environment, Creating and Editing Documents, Formatting, Saving, Retrieving and Printing Text, Profiling Documents and Spreadsheet programs such as Excel. | 15 |
| IV | Event Marketing: Marketing Concept, Marketing Mix, Marketing Planning, Marketing Budget, Merchandising,Marketing Control, Brand Promotion and Catchment Area | 15 |
| V* | | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>9. Shone, Anton and Bryn Parry, Successful Event Management, Cengage Learning India Pvt. Ltd, New Delhi<br>10. Gaur, S.S. and Saggere, S.V., Event Marketing Management<br>11. Panwar, J.S., Marketing in the New Era, Sage Publications, 1998 |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Business Administration** | | |
| Semester | **VI** | | |
| Name of the Course | **Security Analysis and Portfolio Management** | | |
| Course Code | **B23-VOC-326** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **VOC-3** | | |
| Level of the course (As per Annexure-I | **Intermediate Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1To demonstrate the processes of calculating risk and return of financial assets.<br>2. To appraise the processes of doing fundamental and technical analysis.<br>3. To define the concepts and terminologies of portfolio management.<br>4. To summarise the theories underlying portfolio management.<br>5*. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | The Investment Environment - Meaning and objective of investment, investment vs. gambling and speculation, investment alternatives, investment process, concept of return and risk. | 15 |
| II | Security Analysis – Fundamental analysis: economic analysis, industry analysis and company analysis. Technical analysis: assumptions Dow theory, chart patterns, moving averages and market indicators. Efficient market theory: weak form hypothesis, semi-strong form hypothesis and strong form hypothesis. | 15 |
| III | Introduction to Portfolio Management: Meaning, need, and objective of portfolio management, the process of portfolio management, determination of risk & return of a portfolio, risk analysis tools. | 15 |
| IV | Theories of portfolio selection and management- Markowitz portfolio theory: optimal portfolio, meaning and construction of efficient frontier, investors' utility; CAPM: capital asset pricing model, risk-free and risky lending and borrowing. | 15 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | End Term Examination: **70** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Pandian, Security Analysis and Portfolio Management, Vikas Publishing House, New Delhi.<br>2. Reilly, Frank K. And Brown, Keith C., Investment Analysis and Portfolio Management, South-Western Cengage Learning India Pvt. Ltd.<br>3. Bodie, Z., Kane, A. and Marcus, A., Investments, McGraw-Hill.<br>4. Fischer, Donald E. and Jordan, Ronald J., Security Analysis and Portfolio Management, Prentice Hall of India. |

# Kurukshetra University, Kurukshetra

**(Established by the State Legislature Act XII of 1956)**
**(‘A+’ Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योग युक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Scheme of Examination (1st Year) for Under-Graduate Programmes

**Bachelor of Computer Applications (Artificial Intelligence)**

**BCA (AI): SCHEME D**

according to

Curriculum Framework for Under-Graduate Programmes

As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)

## DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

(For the Batches Admitted From 2023-2024)

**Kurukshetra University Kurukshetra**
**Scheme of Examination (1st Year) for Undergraduate programmes**
**Subject: BCA (Artificial Intelligence)**
**According to**
**Curriculum Framework for Undergraduate Programmes**
**as per NEP 2020** (Multiple Entry-Exit, Internships and Choice Based Credit System)

| **Sem** | **Course Type** | **Course Code** | **Nomenclature of paper** | Credits | Contact hours | **Internal marks** | **End term Marks** | **Total Marks** | Duration of exam (Hrs) T + P |
|---|---|---|---|---|---|---|---|---|---|
| 1 | CC-A1 | B23-CAL-101 | Problem Solving through C | 3 | 3 | 20 | 50 | 70 | 3 |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-B1 | B23- CAL -102 | Foundations of Computer Science | 3 | 3 | 20 | 50 | 70 | 3 |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-C1 | B23- CAL -103 | Logical Organization of Computer | 3 | 3 | 20 | 50 | 70 | 3 |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-M1 | B23- CAL -104 | Mathematical Foundations for Computer Science-I | 1 | 1 | 10 | 20 | 30 | 3 |
| | | | Practical | 1 | 2 | 5 | 15 | 20 | 3 |
| | MDC1 | To be taken from other department | | | | | | | |
| | SEC1 | To be taken from SEC Pool | | | | | | | |
| | VAC1 | To be taken from VAC Pool | | | | | | | |
| | AEC1 | To be taken from AEC Pool | | | | | | | |
| 2 | CC-A2 | B23- CAL -201 | Object Oriented | 3 | 3 | 20 | 50 | 70 | 3 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Programming using C++ | | | | | | |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-B2 | B23- CAL -202 | Introduction to Web Technologies | 3 | 3 | 20 | 50 | 70 | 3 |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-C2 | B23- CAL -203 | Concepts of Operating Systems | 3 | 3 | 20 | 50 | 70 | 3 |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-M2 | B23- CAL -204 | Mathematical Foundations for Computer Science-II | 1 | 1 | 10 | 20 | 30 | 3 |
| | | | Practical | 1 | 2 | 5 | 15 | 20 | 3 |
| | MDC-2 | To be taken from other department | | | | | | | |
| | SEC-2 | To be taken from SEC Pool | | | | | | | |
| | VAC-2 | To be taken from VAC Pool | | | | | | | |
| | AEC-2 | To be taken from AEC Pool | | | | | | | |

# Kurukshetra University, Kurukshetra

**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योग युक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Syllabus of Examination (1st Semester) for Under-Graduate Programmes

**Bachelor of Computer Applications**
**(Artificial Intelligence)**
**BCA(AI)**

according to
Curriculum Framework for Under-Graduate Programmes
As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)

## DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

(For the Batches Admitted From 2023-2024)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (AI) | | |
| Semester | I | | |
| Name of the Course | Problem Solving through C | | |
| Course Code | B23- CAL -101 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn the basics of C program, data types and input/output statements.<br>2. understand different types of operators, their hierarchies and also control statements of C.<br>3. implement programs using arrays and strings.<br>4. get familiar with advanced concepts like structures, union etc. in C language.<br>5*. to implement the programs based on various concepts of C. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**Instructions for Paper- Setter**

Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.

Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.

Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Overview of C: History, Importance, Structure of C Program, Character Set, Constants and Variables, Identifiers and Keywords, Data Types, Assignment Statement, Symbolic Constant.<br>Input/output: Formatted I/O Function-, Input Functions viz. scanf(), getch(), getche(), getchar(), gets(),<br>output functions viz. printf(), putch(), putchar(), puts(). | 10 |
| II | Operators & Expression: Arithmetic, Relational, Logical, Bitwise, Unary, Assignment, Conditional Operators and Special Operators Operator Hierarchy; Arithmetic Expressions, Evaluation of Arithmetic Expression,<br>Type Casting and Conversion. Decision making with if statement, if-else statement, nested if statement, else-if ladder, switch and break statement, goto statement, Looping Statements: for, while, and do-while loop, jumps in loops. | 10 |
| III | Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays -Declaration, Initialization and Memory representation.<br>Functions: definition, prototype, function call, passing arguments to a function: call by value; call by reference, recursive functions.<br>Strings: Declaration and Initialization, String I/O, Array of Strings, String Manipulation Functions: String Length, Copy, Compare, Concatenate etc., Search for a Substring. | 10 |
| IV | Pointers in C: Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays.<br>User defined data types: Structures - Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, Array of Structures; Unions - Union definition; difference between Structure and Union. | 10 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited | 25 |

| | | |
|---|---|---|
| | to, but including the following types of problems:<br>• To read radius of a circle and to find area and circumference<br>• To read three numbers and find the biggest of three<br>• To check whether the number is prime or not<br>• To read a number, find the sum of the digits, reverse the number and check it for palindrome<br>• To read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers<br>• To read percentage of marks and to display appropriate message (Demonstration of else-if ladder)<br>• To find the roots of quadratic equation<br>• To read marks scored by n students and find the average of marks (Demonstration of single dimensional array)<br>• To remove Duplicate Element in a single dimensional Array<br>• To perform addition and subtraction of Matrices<br>• To find factorial of a number<br>• To generate Fibonacci series<br>• To remove Duplicate Element in a single dimensional Array<br>• To find the length of a string without using built in function<br>• To demonstrate string functions<br>• To read, display and add two m x n matrices using functions<br>• To read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters<br>• To Swap Two Numbers using Pointers<br>• To demonstrate student structure to read & display records of n students<br>• To demonstrate the difference between structure & union. | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | **End Term Examination:** A three hour exam for both theory and practicum.<br>End Term Exam Marks: 70(50(T)+20(P)) |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Gottfried, Byron S., Programming with C, Tata McGraw Hill.
- Balagurusamy, E., Programming in ANSI C, Tata McGraw-Hill.
- Jeri R. Hanly & Elliot P. Koffman, Problem Solving and Program Design in C, Addison

Wesley.
- Yashwant Kanetker, Let us C, BPB.
- Rajaraman, V., Computer Programming in C, PHI.
- Yashwant Kanetker, Working with C, BPB.

*Applicable for courses having practical component.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA(AI) | | |
| Semester | I | | |
| Name of the Course | Foundations of Computer Science | | |
| Course Code | B23- CAL -102 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. understand the basics of computer<br>2. learn about I/O devices and operating systems<br>3. understand internet and its services<br>4. learn about the threats and security concepts on computers<br>5*. to understand the working of operating system, internet and security related concepts. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |
| **<u>Instructions for Paper- Setter</u>**<br>Examiner will set a total of nine questions. Out of which first question will be compulsory. | | | |

| | | |
|---|---|---|
| Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.<br>Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.<br>Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Computer Fundamentals: Evolution of Computers through generations, Characteristics of Computers, Strengths and Limitations of Computers, Classification of Computers, Functional Components of a Computer System, Applications of computers in Various Fields. Types of Software: System software, Application software, Utility Software, Shareware, Freeware, Firmware, Free Software.<br>Memory Systems: Concept of bit, byte, word, nibble, storage locations and addresses, measuring units of storage capacity, access time, concept of memory hierarchy. Primary Memory - RAM, ROM, PROM, EPROM. Secondary Memory - Types of storage devices, Magnetic Tape, Hard Disk, Optical Disk, Flash Memory. | 10 |
| II | I/O Devices: I/O Ports of a Desk Top Computer, Device Controller, Device Driver. Input Devices: classification and use, keyboard, pointing devices - mouse, touch pad and track ball, joystick, magnetic stripes, scanner, digital camera, and microphone Output Devices: speaker, monitor, printers: classification, laser, ink jet, dot-matrix. Plotter.<br>Introduction to Operating System**:** Definition, Functions, Features of Operating System, Icon, Folder, File, Start Button, Task Bar, Status Buttons, Folders, Shortcuts, Recycle Bin, Desktop, My Computer, My Documents, Windows Explorer, Control Panel. | 10 |
| III | The Internet: Introduction to networks and internet, history, Internet, Intranet & Extranet, Working of Internet, Modes of Connecting to Internet.<br>Electronic Mail: Introduction, advantages and disadvantages, User Ids, Passwords, e-mail addresses, message components, message composition, mailer features. Browsers and search engines. | 10 |
| IV | Threats: Physical & non-physical threats, Virus, Worm, Trojan, Spyware, Keylogers, Rootkits, Adware, Cookies, Phishing, Hacking, Cracking.<br>Computer Security Fundamentals: Confidentiality, Integrity, Authentication, Non-Repudiation, Security Mechanisms, Security Awareness, Security Policy, anti-virus software & Firewalls, backup | 10 |

| | | |
|---|---|---|
| | & recovery. | |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:<br>Operating System:<br>• Starting with basics of Operating Systems and its functionalities<br>Computer Basics:<br>• Identify the various computer hardware<br>• Understanding the working of computer<br>• Understanding various types of software<br>Internet and E-mail:<br>• Using Internet for various tasks<br>• Creating and using e-mail.<br>Security:<br>• Understanding various threats<br>• How to be safe from virus threats<br>• Various software to get safe from virus attacks. | 25 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | | **End Term Examination:** A three hour exam for both theory and practicum.<br>End Term Exam Marks: 70(50(T)+20(P)) |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>• Sinha, P.K. & Sinha, Priti, Computer Fundamentals, BPB.<br>• Dromey, R.G., How to Solve it By Computer, PHI.<br>• Norton, Peter, Introduction to Computer, McGraw-Hill.<br>• Leon, Alexis & Leon, Mathews, Introduction to Computers, Leon Tech World.<br>• Rajaraman, V., Fundamentals of Computers, PHI. | | |

*Applicable for courses having practical component.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA(AI) | | |
| Semester | I | | |
| Name of the Course | Logical Organization of Computer | | |
| Course Code | B23- CAL -103 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | Basic Knowledge of Mathematics (10th Level) | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. understand number systems, error detecting correcting code and representations of numbers in a computer system.<br>2. understand computer arithmetic and Boolean algebra and simplification of Boolean expressions.<br>3. understand working of logic gates and design various combinational circuits using these logic gates.<br>4. understand working of different types of flip-flops and design different types of registers.<br>5*. to understand the practical aspects of logical organization of computer. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br>Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.<br>Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.<br>Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Number Systems: Binary, Octal, Hexadecimal etc. Conversions from one number system to another, BCD Number<br>System. BCD Codes: Natural Binary Code, Weighted Code, Self-Complimenting Code, Cyclic Code.<br>Error Detecting and Correcting Codes. Character representations: ASCII, EBCDIC and Unicode.<br>Number Representations: Integer numbers - sign-magnitude, 1's & 2's complement representation. Real Numbers normalized floating point representations. | 10 |
| II | Binary Arithmetic: Binary Addition, Binary Subtraction, Binary Multiplication, Binary Division using 1's and 2's Compliment representations, Addition and subtraction with BCD representations.<br>Boolean Algebra: Boolean Algebra Postulates, basic Boolean Theorems, Boolean Expressions, Boolean Functions, Truth Tables, Canonical Representation of Boolean Expressions: SOP and POS, Simplification of Boolean Expressions using Boolean Postulates & Theorems, Kaurnaugh-Maps (upto four variables), Handling Don't Care conditions. | 10 |
| III | Logic Gates: Basic Logic Gates – AND, OR, NOT, Universal Gates – NAND, NOR, Other Gates – XOR, XNOR etc. Their symbols, truth tables and Boolean expressions.<br>Combinational Circuits: Design Procedures, Half Adder, Full Adder, Half Subtractor, Full Subtractor, Multiplexers, Demultiplexers, Decoder, Encoder, Comparators, Code Converters. | 10 |
| IV | Sequential Circuits: Basic Flip- Flops and their working. Synchronous and Asynchronous Flip –Flops, Triggering of Flip-Flops, Clocked RS, D Type, JK, T type and Master-Slave Flip-Flops. State Table, State Diagram and State Equations.<br>Flip-flops characteristics & Excitation Tables. | 10 |

| | | |
|---|---|---|
| | Sequential Circuits: Designing registers –Serial-In Serial-Out (SISO), Serial-In Parallel-Out (SIPO), Parallel-In Serial-Out (PISO) Parallel-In Parallel-Out (PIPO) and shift registers. | |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:<br>Number System:<br>• Problems based on Number System and their conversion.<br>• Programs based on Number System conversion.<br>Binary Arithmetic<br>• Problems based on Binary Arithmetic.<br>• Programs based on Binary Arithmetic.<br>• Problems based on Boolean Expression and their simplification<br>Logic Gates<br>• Understanding working of logic Gates.<br>Combinatorial Circuits:<br>• Designing and understanding various combinational circuits.<br>Sequential Circuits:<br>• Designing and understanding various sequential circuits. | 25 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | | **End Term Examination:**<br>A three hour exam for both theory and practicum.<br>End Term Exam Marks: 70(50(T)+20(P)) |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>• M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.<br>• V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall.<br>• Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.<br>• Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill. | | |

*Applicable for courses having practical component.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA(AI) | | |
| Semester | I | | |
| Name of the Course | Mathematical Foundations for Computer Science-I | | |
| Course Code | B23- CAL -104 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After learning this course student will be able:<br>1. Gain the knowledge of set theory, types of sets and operations on sets. Understand various concepts of matrices and determinants, and acquire the cognitive skills to apply different operations on matrices and determinants.<br>2. Have the knowledge of the basic concepts of complex numbers and acquire skills to solve linear quadratic equations.<br>3. Gain the knowledge of the concepts of Arithmetic progression, Geometric progression and Harmonic progression, and find A.M., G.M. and H.M. of given numbers.<br>4. Understand the concept of differentiation<br>5. * Attain the skills to make use of the learnt concepts of Introductory Mathematics in multidisciplinary learning contexts and to know their applications | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| Contact Hours | 1 | 2 | 3 |

| | |
|---|---|
| **Max. Marks:50(30(T)+20(P))**<br>**Internal Assessment Marks:15(10(T)+5(P))**<br>**End Term Exam Marks:35(20(T)+15(P))** | **Time: 3 Hrs.(T), 3Hrs.(P)** |

**Part B-Contents of the Course**

**Instructions for Paper- Setter**

Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.

Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.

Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Sets and their representations, Empty set, Finite and infinite sets, Subsets, Equal sets, Power sets, Universal set, Union and intersection of sets, Difference of two sets, Complement of a set, Venn diagram, De-Morgan's laws and their applications. | 4 |
| II | An introduction to matrices and their types, Operations on matrices, Symmetric and skew-symmetric matrices, Minors, Co-factors. Determinant of a square matrix, Adjoint and inverse of a square matrix, Solutions of a system of linear equations up to order 3. | 4 |
| III | Quadratic equations, Solution of quadratic equations.<br>Arithmetic progression, Geometric progression, Harmonic progression, Arithmetic mean (A.M.), Geometric mean (G.M.), Harmonic mean (H.M.), Relation between A.M., G.M. and H.M. | 4 |
| IV | The concept of differentiation, differentiation of simple functions, Use of differentiation for solving problems related to real-life situations. Differentiation of simple algebraic, trigonometric and exponential functions. | 4 |

| | | |
|---|---|---|
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:<br>**Problem Solving-** Questions related to the practical problems based on following topics will be worked out and record of those will be maintained in the Practical Note Book:<br>• Problems related to union, intersection, difference and complement of sets.<br>• Problems based on De Morgan's Laws.<br>• Problems related to Venn diagrams.<br>• Problems to find inverse of a matrix.<br>• Problems to find determinant of a square matrix of order 3.<br>• Problems to find nth term of A.P., G.P. and H.P.<br>• Problems to find sum of n terms of A.P., G.P. and H.P. | 25 |

| | | |
|---|---|---|
| | • Problems to find A.M., G.M. and H.M. of given numbers.<br>• Problems involving formulation and solution of quadratic equations in one variable.<br>• Problems to find first derivatives of functions. | |

| **Suggested Evaluation Methods** | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: NA<br>• Mid-Term Exam: 6<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**A three hour exam for both theory and practicum.**<br>End Term Exam Marks:35(20(T)+15(P)) |

**Part C-Learning Resources**

**Text /Reference Books:**


- C. Y. Young (2021). *Algebra and Trigonometry*. Wiley.
- S.L. Loney (2016). *The Elements of Coordinate Geometry (Cartesian Coordinates)* (2nd Edition). G.K. Publication Private Limited.
- Seymour Lipschutz and Marc Lars Lipson (2013). *Linear Algebra.* (4th Edition) Schaum's Outline Series, McGraw-Hill.
- C.C. Pinter (2014). *A Book of Set Theory*. Dover Publications.
- J. V. Dyke, J. Rogers and H. Adams (2011). *Fundamentals of Mathematics* (10th Edition), Brooks/Cole.
- A.Tussy, R. Gustafson and D. Koenig (2010). *Basic Mathematics for College Students* (4th Edition). Brooks Cole


*Applicable for courses having practical component.

# Kurukshetra University, Kurukshetra
**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योग युक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Scheme of Examination (1st Year) for Under-Graduate Programmes
**Bachelor of Computer Applications (Data Science)**
**BCA (DS): SCHEME D**
according to
Curriculum Framework for Under-Graduate Programmes
As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
(For the Batches Admitted From 2023-2024)

**Kurukshetra University Kurukshetra**
**Scheme of Examination(1st Year) for Undergraduate programmes**
**Subject: BCA (Data Science)**
**According to**
**Curriculum Framework for Undergraduate Programmes**
**as per NEP 2020** (Multiple Entry-Exit, Internships and Choice Based Credit System)

| **Sem** | **Course Type** | **Course Code** | **Nomenclature of paper** | Credits | Contact hours | **Internal marks** | **End term Marks** | **Total Marks** | Duration of exam (Hrs) T + P |
|---|---|---|---|---|---|---|---|---|---|
| 1 | CC-A1 | B23-CDS-101 | Problem Solving through C | 3 | 3 | 20 | 50 | 70 | 3 |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-B1 | B23-CDS-102 | Foundations of Computer Science | 3 | 3 | 20 | 50 | 70 | 3 |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-C1 | B23-CDS-103 | Logical Organization of Computer | 3 | 3 | 20 | 50 | 70 | 3 |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-M1 | B23-CDS-104 | Mathematical Foundations for Computer Science-I | 1 | 1 | 10 | 20 | 30 | 3 |
| | | | Practical | 1 | 2 | 5 | 15 | 20 | 3 |
| | MDC1 | To be taken from other department | | | | | | | |
| | SEC1 | To be taken from SEC Pool | | | | | | | |
| | VAC1 | To be taken from VAC Pool | | | | | | | |
| | AEC1 | To be taken from AEC Pool | | | | | | | |
| 2 | CC-A2 | B23-CDS-201 | Object Oriented | 3 | 3 | 20 | 50 | 70 | 3 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Programming using C++ | | | | | | |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-B2 | B23-CDS-202 | Introduction to Web Technologies | 3 | 3 | 20 | 50 | 70 | 3 |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-C2 | B23-CDS-203 | Concepts of Operating Systems | 3 | 3 | 20 | 50 | 70 | 3 |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 |
| | CC-M2 | B23-CDS-204 | Mathematical Foundations for Computer Science-II | 1 | 1 | 10 | 20 | 30 | 3 |
| | | | Practical | 1 | 2 | 5 | 15 | 20 | 3 |
| | MDC-2 | To be taken from other department | | | | | | | |
| | SEC-2 | To be taken from SEC Pool | | | | | | | |
| | VAC-2 | To be taken from VAC Pool | | | | | | | |
| | AEC-2 | To be taken from AEC Pool | | | | | | | |

# Kurukshetra University, Kurukshetra
**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योग युक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Syllabus of Examination (1st Semester) for Under-Graduate Programmes

**Bachelor of Computer Applications**
**(Data Science)**
**BCA (DS)**

according to
Curriculum Framework for Under-Graduate Programmes
As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)

## DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

(For the Batches Admitted From 2023-2024)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (DS) | | |
| Semester | I | | |
| Name of the Course | Problem Solving through C | | |
| Course Code | B23-CDS-101 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn the basics of C program, data types and input/output statements.<br>2. understand different types of operators, their hierarchies and also control statements of C.<br>3. implement programs using arrays and strings.<br>4. get familiar with advanced concepts like structures, union etc. in C language.<br>5*. to implement the programs based on various concepts of C. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**Instructions for Paper- Setter**

Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.

Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.

Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Overview of C: History, Importance, Structure of C Program, Character Set, Constants and Variables, Identifiers and Keywords, Data Types, Assignment Statement, Symbolic Constant.<br>Input/output: Formatted I/O Function-, Input Functions viz. scanf(), getch(), getche(), getchar(), gets(),<br>output functions viz. printf(), putch(), putchar(), puts(). | 10 |
| II | Operators & Expression: Arithmetic, Relational, Logical, Bitwise, Unary, Assignment, Conditional Operators and Special Operators Operator Hierarchy; Arithmetic Expressions, Evaluation of Arithmetic Expression,<br>Type Casting and Conversion. Decision making with if statement, if-else statement, nested if statement, else-if ladder, switch and break statement, goto statement, Looping Statements: for, while, and do-while loop, jumps in loops. | 10 |
| III | Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays -Declaration, Initialization and Memory representation.<br>Functions: definition, prototype, function call, passing arguments to a function: call by value; call by reference, recursive functions.<br>Strings: Declaration and Initialization, String I/O, Array of Strings, String Manipulation Functions: String Length, Copy, Compare, Concatenate etc., Search for a Substring. | 10 |
| IV | Pointers in C: Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays.<br>User defined data types: Structures - Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, Array of Structures; Unions - Union definition; difference between Structure and Union. | 10 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited | 25 |

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| | to, but including the following types of problems:<br>• To read radius of a circle and to find area and circumference<br>• To read three numbers and find the biggest of three<br>• To check whether the number is prime or not<br>• To read a number, find the sum of the digits, reverse the number and check it for palindrome<br>• To read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers<br>• To read percentage of marks and to display appropriate message (Demonstration of else-if ladder)<br>• To find the roots of quadratic equation<br>• To read marks scored by n students and find the average of marks (Demonstration of single dimensional array)<br>• To remove Duplicate Element in a single dimensional Array<br>• To perform addition and subtraction of Matrices<br>• To find factorial of a number<br>• To generate Fibonacci series<br>• To remove Duplicate Element in a single dimensional Array<br>• To find the length of a string without using built in function<br>• To demonstrate string functions<br>• To read, display and add two m x n matrices using functions<br>• To read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters<br>• To Swap Two Numbers using Pointers<br>• To demonstrate student structure to read & display records of n students<br>• To demonstrate the difference between structure & union. | |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | | **End Term Examination:** A three hour exam for both theory and practicum.<br>End Term Exam Marks: 70(50(T)+20(P)) |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>• Gottfried, Byron S., Programming with C, Tata McGraw Hill.<br>• Balagurusamy, E., Programming in ANSI C, Tata McGraw-Hill.<br>• Jeri R. Hanly & Elliot P. Koffman, Problem Solving and Program Design in C, Addison | | |

Wesley.
- Yashwant Kanetker, Let us C, BPB.
- Rajaraman, V., Computer Programming in C, PHI.
- Yashwant Kanetker, Working with C, BPB.

*Applicable for courses having practical component.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA(DS) | | |
| Semester | I | | |
| Name of the Course | Foundations of Computer Science | | |
| Course Code | B23-CDS-102 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. understand the basics of computer<br>2. learn about I/O devices and operating systems<br>3. understand internet and its services<br>4. learn about the threats and security concepts on computers<br>5*. to understand the working of operating system, internet and security related concepts. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |
| **Instructions for Paper- Setter**<br>Examiner will set a total of nine questions. Out of which first question will be compulsory. | | | |

| | | |
|---|---|---|
| Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.<br>Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.<br>Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Computer Fundamentals: Evolution of Computers through generations, Characteristics of Computers, Strengths and Limitations of Computers, Classification of Computers, Functional Components of a Computer System, Applications of computers in Various Fields. Types of Software: System software, Application software, Utility Software, Shareware, Freeware, Firmware, Free Software.<br>Memory Systems: Concept of bit, byte, word, nibble, storage locations and addresses, measuring units of storage capacity, access time, concept of memory hierarchy. Primary Memory - RAM, ROM, PROM, EPROM. Secondary Memory - Types of storage devices, Magnetic Tape, Hard Disk, Optical Disk, Flash Memory. | 10 |
| II | I/O Devices: I/O Ports of a Desk Top Computer, Device Controller, Device Driver. Input Devices: classification and use, keyboard, pointing devices - mouse, touch pad and track ball, joystick, magnetic stripes, scanner, digital camera, and microphone Output Devices: speaker, monitor, printers: classification, laser, ink jet, dot-matrix. Plotter.<br>Introduction to Operating System**:** Definition, Functions, Features of Operating System, Icon, Folder, File, Start Button, Task Bar, Status Buttons, Folders, Shortcuts, Recycle Bin, Desktop, My Computer, My Documents, Windows Explorer, Control Panel. | 10 |
| III | The Internet: Introduction to networks and internet, history, Internet, Intranet & Extranet, Working of Internet, Modes of Connecting to Internet.<br>Electronic Mail: Introduction, advantages and disadvantages, User Ids, Passwords, e-mail addresses, message components, message composition, mailer features. Browsers and search engines. | 10 |
| IV | Threats: Physical & non-physical threats, Virus, Worm, Trojan, Spyware, Keylogers, Rootkits, Adware, Cookies, Phishing, Hacking, Cracking.<br>Computer Security Fundamentals: Confidentiality, Integrity, Authentication, Non-Repudiation, Security Mechanisms, Security Awareness, Security Policy, anti-virus software & Firewalls, backup | 10 |

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|---|---|---|
| | & recovery. | |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:<br>Operating System:<br>• Starting with basics of Operating Systems and its functionalities<br>Computer Basics:<br>• Identify the various computer hardware<br>• Understanding the working of computer<br>• Understanding various types of software<br>Internet and E-mail:<br>• Using Internet for various tasks<br>• Creating and using e-mail.<br>Security:<br>• Understanding various threats<br>• How to be safe from virus threats<br>• Various software to get safe from virus attacks. | 25 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | | **End Term Examination:** A three hour exam for both theory and practicum.<br>End Term Exam Marks: 70(50(T)+20(P)) |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>• Sinha, P.K. & Sinha, Priti, Computer Fundamentals, BPB.<br>• Dromey, R.G., How to Solve it By Computer, PHI.<br>• Norton, Peter, Introduction to Computer, McGraw-Hill.<br>• Leon, Alexis & Leon, Mathews, Introduction to Computers, Leon Tech World.<br>• Rajaraman, V., Fundamentals of Computers, PHI. | | |

*Applicable for courses having practical component.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA(DS) | | |
| Semester | I | | |
| Name of the Course | Logical Organization of Computer | | |
| Course Code | B23-CDS-103 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | Basic Knowledge of Mathematics (10th Level) | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. understand number systems, error detecting correcting code and representations of numbers in a computer system.<br>2. understand computer arithmetic and Boolean algebra and simplification of Boolean expressions.<br>3. understand working of logic gates and design various combinational circuits using these logic gates.<br>4. understand working of different types of flip-flops and design different types of registers.<br>5*. to understand the practical aspects of logical organization of computer. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br>Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.<br>Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.<br>Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Number Systems: Binary, Octal, Hexadecimal etc. Conversions from one number system to another, BCD Number<br>System. BCD Codes: Natural Binary Code, Weighted Code, Self-Complimenting Code, Cyclic Code.<br>Error Detecting and Correcting Codes. Character representations: ASCII, EBCDIC and Unicode.<br>Number Representations: Integer numbers - sign-magnitude, 1's & 2's complement representation. Real Numbers normalized floating point representations. | 10 |
| II | Binary Arithmetic: Binary Addition, Binary Subtraction, Binary Multiplication, Binary Division using 1's and 2's Compliment representations, Addition and subtraction with BCD representations.<br>Boolean Algebra: Boolean Algebra Postulates, basic Boolean Theorems, Boolean Expressions, Boolean Functions, Truth Tables, Canonical Representation of Boolean Expressions: SOP and POS, Simplification of Boolean Expressions using Boolean Postulates & Theorems, Kaurnaugh-Maps (upto four variables), Handling Don't Care conditions. | 10 |
| III | Logic Gates: Basic Logic Gates – AND, OR, NOT, Universal Gates – NAND, NOR, Other Gates – XOR, XNOR etc. Their symbols, truth tables and Boolean expressions.<br>Combinational Circuits: Design Procedures, Half Adder, Full Adder, Half Subtractor, Full Subtractor, Multiplexers, Demultiplexers, Decoder, Encoder, Comparators, Code Converters. | 10 |
| IV | Sequential Circuits: Basic Flip- Flops and their working. Synchronous and Asynchronous Flip –Flops, Triggering of Flip-Flops, Clocked RS, D Type, JK, T type and Master-Slave Flip-Flops. State Table, State Diagram and State Equations.<br>Flip-flops characteristics & Excitation Tables. | 10 |

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| | Sequential Circuits: Designing registers –Serial-In Serial-Out (SISO), Serial-In Parallel-Out (SIPO), Parallel-In Serial-Out (PISO) Parallel-In Parallel-Out (PIPO) and shift registers. | |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:<br>Number System:<br>• Problems based on Number System and their conversion.<br>• Programs based on Number System conversion.<br>Binary Arithmetic<br>• Problems based on Binary Arithmetic.<br>• Programs based on Binary Arithmetic.<br>• Problems based on Boolean Expression and their simplification<br>Logic Gates<br>• Understanding working of logic Gates.<br>Combinatorial Circuits:<br>• Designing and understanding various combinational circuits.<br>Sequential Circuits:<br>• Designing and understanding various sequential circuits. | 25 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | | **End Term Examination:** A three hour exam for both theory and practicum.<br>End Term Exam Marks: 70(50(T)+20(P)) |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>• M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.<br>• V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall.<br>• Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.<br>• Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill. | | |

*Applicable for courses having practical component.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA(DS) | | |
| Semester | I | | |
| Name of the Course | Mathematical Foundations for Computer Science-I | | |
| Course Code | B23-CDS-104 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After learning this course student will be able:<br>1. Gain the knowledge of set theory, types of sets and operations on sets. Understand various concepts of matrices and determinants, and acquire the cognitive skills to apply different operations on matrices and determinants.<br>2. Have the knowledge of the basic concepts of complex numbers and acquire skills to solve linear quadratic equations.<br>3. Gain the knowledge of the concepts of Arithmetic progression, Geometric progression and Harmonic progression, and find A.M., G.M. and H.M. of given numbers.<br>4. Understand the concept of differentiation<br>5. * Attain the skills to make use of the learnt concepts of Introductory Mathematics in multidisciplinary learning contexts and to know their applications | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| Contact Hours | 1 | 2 | 3 |

| | |
|---|---|
| **Max. Marks:50(30(T)+20(P))**<br>**Internal Assessment Marks:15(10(T)+5(P))**<br>**End Term Exam Marks:35(20(T)+15(P))** | **Time: 3 Hrs.(T), 3Hrs.(P)** |

**Part B-Contents of the Course**

**Instructions for Paper- Setter**

Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.

Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.

Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Sets and their representations, Empty set, Finite and infinite sets, Subsets, Equal sets, Power sets, Universal set, Union and intersection of sets, Difference of two sets, Complement of a set, Venn diagram, De-Morgan's laws and their applications. | 4 |
| II | An introduction to matrices and their types, Operations on matrices, Symmetric and skew-symmetric matrices, Minors, Co-factors. Determinant of a square matrix, Adjoint and inverse of a square matrix, Solutions of a system of linear equations up to order 3. | 4 |
| III | Quadratic equations, Solution of quadratic equations.<br>Arithmetic progression, Geometric progression, Harmonic progression, Arithmetic mean (A.M.), Geometric mean (G.M.), Harmonic mean (H.M.), Relation between A.M., G.M. and H.M. | 4 |
| IV | The concept of differentiation, differentiation of simple functions, Use of differentiation for solving problems related to real-life situations. Differentiation of simple algebraic, trigonometric and exponential functions. | 4 |

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|---|---|---|
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:<br>**Problem Solving-** Questions related to the practical problems based on following topics will be worked out and record of those will be maintained in the Practical Note Book:<br>• Problems related to union, intersection, difference and complement of sets.<br>• Problems based on De Morgan's Laws.<br>• Problems related to Venn diagrams.<br>• Problems to find inverse of a matrix.<br>• Problems to find determinant of a square matrix of order 3.<br>• Problems to find nth term of A.P., G.P. and H.P.<br>• Problems to find sum of n terms of A.P., G.P. and H.P. | 25 |

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|---|---|---|
| | • Problems to find A.M., G.M. and H.M. of given numbers.<br>• Problems involving formulation and solution of quadratic equations in one variable.<br>• Problems to find first derivatives of functions. | |

| **Suggested Evaluation Methods** | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: NA<br>• Mid-Term Exam: 6<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**A three hour exam for both theory and practicum.**<br>End Term Exam Marks:35(20(T)+15(P)) |

**Part C-Learning Resources**

**Text /Reference Books:**


- C. Y. Young (2021). *Algebra and Trigonometry*. Wiley.
- S.L. Loney (2016). *The Elements of Coordinate Geometry (Cartesian Coordinates)* (2nd Edition). G.K. Publication Private Limited.
- Seymour Lipschutz and Marc Lars Lipson (2013). *Linear Algebra*. (4th Edition) Schaum's Outline Series, McGraw-Hill.
- C.C. Pinter (2014). *A Book of Set Theory*. Dover Publications.
- J. V. Dyke, J. Rogers and H. Adams (2011). *Fundamentals of Mathematics* (10th Edition), Brooks/Cole.
- A.Tussy, R. Gustafson and D. Koenig (2010). *Basic Mathematics for College Students* (4th Edition). Brooks Cole


*Applicable for courses having practical component.

# DEPARTMENT OF ECONOMICS
# KURUKSHETRA UNIVERSITY KURUKSHETRA
## (Established by the State Legislature Act XII of 1956)
## ($A^+$ Grade, NAAC Accredited)

**Scheme-A**

**Scheme of Examination and Syllabus for Undergraduate Programme**

## Subject: Rural Industrialization

## Under Multiple Entry-Exit, Internship and CBCS-LOCF in Accordance with NEP-2020 w.e.f. 2023-24 (in phased manner)

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**
**(Established by the state Legislature Act –XII of 1956)**
**DEPARTMENT OF ECONOMICS**

**UG Programme Subject: - Rural Industrialization, Scheme of Exams (Semester I to VI) and Syllabus (Semester I to IV) under (Multiple Entry-Exit Internship, CBCS-LOCF) According to NEP-2020 w.e.f. 2023-24 in the phase manner.**

**(Scheme A)**

| Semester | Course Type | Course Code | Name of Course | Credits | Contact Hours per Week | Internal Assessment Marks | End Term Exam Marks | Total Marks | Duration of Exam (Hrs.) |
|---|---|---|---|---|---|---|---|---|---|
| I | CC-1 | B23-RIN-101 | Introduction to Rural Industrialization-I | 4 | 4 | 30 | 70 | 100 | 3 |
| II | CC-2 | B23-RIN-201 | Introduction to Rural Industrialization – II | 4 | 4 | 30 | 70 | 100 | 3 |
| III | CC-3 | B23-RIN-301 | Economic Environment For Rural Industrialization-I | 4 | 4 | 30 | 70 | 100 | 3 |
| IV | CC-4 | B23-RIN-401 | Economic Environment For Rural Industrialization-II | 4 | 4 | 30 | 70 | 100 | 3 |
| V | CC-5 | B23-RIN-501 | Rural Industrialization In Haryana | 4 | 4 | 30 | 70 | 100 | 3 |
| VI | CC-6 | B23-RIN-601 | Rural Industry Feasibility Report * | 4 | 4 | 30 | 70 | 100 | 3 |

**Feasibility Report ***

a. **Feasibility Report** shall be prepared by the Students containing three sections i.e. market feasibility, Technical Feasibility and Financial Feasibility of a Rural Industry Business to start a new unit.

b. The Rural Industry Business for the report can either be selected by the Student or suggested by the Faculty at the beginning of the Fifth Semester.

c. **Submission of Feasibility Report** by the Students to the Department shall either be before the end of the Sixth Semester [i.e., on or before the last working day of the Semester].

d. **Feasibility Report weightage**

| | |
|---|---|
| Internal Assessment (based on the presentation by the candidate) | 30 marks |
| External evaluation of Feasibility Report | 70 marks |

Note:-The CC-M, DSE, MDC, SEC, DSEC, AEC, VAC, VOC Courses to be opted by the Rural Industrialization Students shall be decided by their College/institution.

**Subject: Rural Industrialization**

**Semester-I**

**CC-1**

| **Session 2023-2024** | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Rural Industrialization | | |
| Semester | I | | |
| Name of the Course | Introduction to Rural Industrialization-I | | |
| Course Code | **B23-RIN-101** | | |
| Course Type:(CC/MCC/MDC/ CCM/DSEC/VOC/DSE/PC/AEC/ VAC | CC | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | N.A. | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. Understand the nature and scope of Micro and Small industrial units, including the role of Industrialization, and why it is studied.<br>2. Analyze the role of occupational structure, including the relation between industry and agricultural sectors.<br>3. Evaluate the criterion for distinguishing different types of industries and their classification. | | |
| Credits | Theory | Tutorial | Total |
| | 03 | 1 | 04 |
| Contact Hours | 03 | 1 | 04 |
| **Max.Marks:100**<br>**Internal Assessment Marks:30**<br>**End Term Exam Marks:70** | **Time:3Hrs** | | |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. Nine Questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 objective type (filling blanks, true/false, multiple choice) questions of 2 marks spread over the entire syllabus (2*7=14 marks).
3. For the remaining four questions, students will attempt 4 out of 8 questions from the four units (14 marks each).

| **Unit** | **Topics** | **Contact Hours** |
|---|---|---|
| I | Role of Rural Industrialization in India – Need, significance and future prospects. Occupational structure in India with reference to rural economy of Haryana. | 15 |

| | | |
|---|---|---|
| II | Industrialization and Economic development; Complementarities between Industrial and Agriculture sectors. | 15 |
| III | - Criteria for distinguishing Large, Medium, Small and Micro Industrial units in India;<br>- Demarcation of Rural, Semi-Urban, Urban and Metropolitan Areas in India.<br><br>- Classification of small scale and cottage industries in India.<br><br>-Different types of rural industries- Need based, Raw Material based and skill based.<br><br>-Traditions and trends of rural Industrialization in India. | 15 |
| IV | **Structure of Rural Society:**<br>Small and marginal farmer's conditions, problems and Govt. Measures, Land Less Labour –Position, problems and steps taken for their upliftment<br><br>Rural Artisans- Status, Training facilities and their problems. | 15 |
| V* | | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment: 30**<br>➢ **Theory (All these activities will be covered under Tutorials. Approximate contact Hours=12)**<br>Class Participation 5<br>Seminar/ Presentation/ Assignment/ Quiz/ Class Test etc. 10<br>Mid Term Exam 15<br>➢ **Practicum**<br>Class Participation<br>Seminar/ Demonstration/ Viva-Voce/ Lab Records etc. Mid Term Exam: | **End Term Examination:70**<br>Theory |

**Part-C Learning Resources**

**Recommended Books/ E-Resources/ LMS:**

- Indian Industries Development, Management Finance and Organization- T.R. Sharma & S.D.S. Chauhan
- Planning unit area for Integrated Rural Development- M. Vivekananda
- Rural Banking in India - S.S.M. Desai
- Small, Medium and large scale Industries - A. K. Srivastav
- Industrial Economy in India - P.G. Gadgil
- Industrial Economy - S.C. Kuchhal
- Industrial Progress and Economic Growth - Newal Kishore Singh
- How to start small scale Industries - G.D. Sharma
- Profitable Home Industries and Spare Time Business - K.C. Gupta
- Facilities and Procedure for small Industries - D.C. Gupta
- Financing of Small Scale Industries - Inderjit Singh
- A study of Rural Economics - Vasant Desai
- Indian Economy - Ruddar Dutt, K.P.M. Sundaram
- Some Problems in SSI - Ramesh P.Sinha

*Applicable for course shaving practical component.

**Semester-II**

**CC-2**

| **Session 2023-2024** | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Rural Industrialization | | |
| Semester | II | | |
| Name of the Course | Introduction to Rural Industrialization – II | | |
| Course Code | **B23-RIN-201** | | |
| CourseType:(CC/MCC/MDC/CCM/DSEC/VOC/DSE/PC/AEC/VAC | CC | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | N.A. | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. Have Insight of industries performance during the five year plans, requisites for industrial development.<br>2. Have understanding of Government schemes and rural development programmes.<br>3. Have knowledge about problems and prospects of rural industries. Impact of globalization on rural industries<br>4. Have understanding about Rural industries in China and Japan and lessons what India can learn from their industries. | | |
| | 5*. | | |
| Credits | Theory | Tutorial | Total |
| | 03 | 1 | 04 |
| Contact Hours | 03 | 1 | 04 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:70** | **Time:3Hrs** | | |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. Nine Questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 objective type (filling blanks, true/false, multiple choice) questions of 2 marks spread over the entire syllabus (2*7=14marks).
3. For the remaining four questions, students will attempt 4 out of 8 questions from the four units (14 marks each).

| **Unit** | **Topics** | **Contact Hours** |
|---|---|---|
| I | Requisites for the development of rural Industries; Performance of rural and small scale industries under Five Year plans. Current Economic Planning and village & small scale Industries | 15 |
| II | Role of Khadi and village Industries Board, Rural development Programmes: Swarn Jayanti Gram Swarozgar Yojna (SGSY)- Aims, features and performance; Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS) – objectives, progress and prospects. Micro Financing & Rural Industrialization | 15 |
| III | Village and small scale Industries- problems and prospects Govt. policy towards village and small scale industries. Impact of Globalisation on village and small scale industries. | 15 |
| IV | Rural Industrialization in Japan – Its role in economics development and lessons for India; Rural Industrialization | 15 |

| | | |
|---|---|---|
| | in China- contribution to the economy and lessons for India. | |
| V* | | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment: 30**<br>➢ **Theory (All these activities will be covered under Tutorials. Approximate contact Hours = 15)**<br>Class Participation 5<br>Seminar/ Presentation/ Assignment/ Quiz/ Class Test etc. 10<br>Mid Term Exam 15<br>➢ **Practicum**<br>Class Participation<br>Seminar/ Demonstration/ Viva-Voce/ Lab Records etc. Mid Term Exam: | **End Term Examination:70**<br>Theory |

**Part-C Learning Resources**

**Recommended Books/ E-Resources/ LMS:**

- Dynamics of Industrial Relations in India - C. B. Mamoria
- Organisation of Industry and finance in India - V. C. Sinha
- Development of Non-farm Rural Industries- partap Mathur
- Rural Development in India - D.C. Pant
- Indian Industrial Economy - Dinesh Chander Sharma
- Industrial location and Growth of City - R. K. Srivastri
- Rural Industrialization on India – Sriniwas Thakur

**Semester-III**

**CC-3**

| **Session 2024-2025** | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Rural Industrialization | | |
| Semester | III | | |
| Name of the Course | **ECONOMIC ENVIRONMENT FOR RURAL INDUSTRIALIZATION-I** | | |
| Course Code | **B23-RIN-301** | | |
| Course Type:(CC/MCC/MDC/ CCM/DSEC/VOC/DSE/P C/AEC /VAC | CC | | |
| Level of the course (As per Annexure-I) | 200-299 | | |
| Pre-requisite for the course(if any) | | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>. 1. To understand the industrial location significance and the factors affecting industrial Location.<br>2. To understand importance of marketing, raw material, skilled labour and role of management in industries.<br>3. To understand the sources of finance and significance of quality control.<br>4. To understand how district industrial centres and self help groups function for industries development. | | |
| | 5*. | | |
| Credits | Theory | Tutorial | Total |
| | 03 | 1 | 04 |
| Contact Hours | 03 | 1 | 04 |
| **Max. Marks: 100**<br>**Internal Assessment Marks:30**<br>**End Term Exam Marks:70** | **Time: 3 Hrs.** | | |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. Nine Questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 objective type (filling blanks, true/false, multiple choice) questions of 2 marks spread over the entire syllabus (2*7=14marks).
3. For the remaining four questions, students will attempt 4 out of 8 questions from the four units (14 marks each).

| **Unit** | **Topics** | **Contact Hours** |
|---|---|---|
| I | Industrial location – importance and difficulties.<br><br>Factors affecting industrial location. Raw Material – Classification, significance and problems related to rural industries.<br><br>Marketing – Importance, functions and problems regarding marketing in rural industries. | 15 |

| | | |
|---|---|---|
| II | Skilled labour – Concepts, importance and problems; Characteristics of rural Indian labour; factors affecting efficiency.<br><br>Management – General functions, concepts, need, types and difficulties | 15 |
| III | Finance – Sources and problems in obtaining finance for rural industries. HSIIDC, SIDBI, SFCs.<br><br>Quality Control - Objectives, methods, significance and problems in small scale sector | 15 |
| IV | District Industries Centre - functions, role and evaluation.<br><br>Role of Self-Help Groups and micro-financial Institutions in economic development | 15 |
| V* | | |

| **Suggested Evaluation Methods** | |
|---|---|
| **Internal Assessment: 30**<br>➢ **Theory (All these activities will be covered under Tutorials. Approximate contact Hours=15)**<br>Class Participation 5<br>Seminar/ Presentation/ Assignment/ Quiz/ Class Test etc. :10<br>Mid Term Exam 15<br>➢ **Practicum**<br>Class Participation<br>Seminar/ Demonstration/ Viva-Voce/ Lab Records etc. Mid Term Exam: | **End Term Examination: 70**<br>Theory |

| **Part-C Learning Resources** |
|---|
| **Recommended Books/ E-Resources/ LMS:**<br>• Planning for Rural Development Issues and Case Studies - Dholakia & Iyengal<br>• Management of small scale Industries - Dr. Shashi Bala<br>• Role of Industrial Estates in a developing economy - R.L. Sanhvi<br>• A Practical guide to Industrial Entreprenures- S.B.Srivastav |
| |

*Applicable for courses having practical component.

**Semester-IV**

**CC-4**

| | | | | |
|---|---|---|---|---|
| | | **Session 2024-2025** | | |
| | | **Part-A Introduction** | | |
| Subject | | Rural Industrialization | | |
| Semester | | IV | | |
| Name of the Course | | **ECONOMIC ENVIRONMENT FOR RURAL INDUSTRIALIZATION-II** | | |
| Course Code | | **B23-RIN-401** | | |
| Course Type:(CC/MCC/MDC/ CCM/DSEC/VOC/DSE/PC/AEC/ VAC | | CC/ | | |
| Level of the course (As per Annexure-I) | | 200-299 | | |
| Pre-requisite for the course (if any) | | | | |
| Course Learning Outcomes (CLO) | | After completing this course, the learner will be able to:<br>1. Have understanding about elementary ideas of a survey report , technical and market feasibility for industries.<br>2. Have understanding of financial feasibility and preparation of project report.<br>3. Have knowledge about progress of industries under five year plans. working and operational difficulties faced by the industries.<br>4. Have understanding about sickness of small scale industries and Gandhian philosophy of rural industrialization. | | |
| | | | | |
| Credits | | Theory | Tutorial | Total |
| | | 03 | 1 | 04 |
| Contact Hours | | 03 | 1 | 04 |
| **Max.Marks:100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:70** | | **Time:3Hrs** | | |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. Nine Questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 objective type (filling blanks, true/false, multiple choice) questions of 2 marks spread over the entire syllabus (2*7=14marks).
3. For the remaining four questions, students will attempt 4 out of 8questions from the four units (14 marks each).

| **Unit** | **Topics** | **Contact Hours** |
|---|---|---|
| I | Elementary ideas of a survey report: Objectives, preparation of questionnaire, data compilation and presentation. Salient features of technical and market feasibility studies | 15 |
| II | Financial Feasibility: Total cost of project, means of finance, fix costs, variable costs and break even analysis. Main contents and preparation of Project Report. | 15 |
| III | Industrial Estates: Concepts, objectives advantages and progress under Five Year Plans. Working, significance and operational difficulties. National Programme for Rural Industrialization - objectives and schemes offered | 15 |
| IV | Backward area development and rural Industrialization- Need and operational | 15 |

| | | | |
|---|---|---|---|
| | difficulties. Sickness of small scale sector – causes, implications and remedial measures. Gandhian philosophy of rural Industrialization. | | |
| | | | |
| V* | | | |
| | **Suggested Evaluation Methods** | | |
| | **Internal Assessment: 30**<br>➢ **Theory (All these activities will be covered under Tutorials. Approximate contact Hours=15)**<br>Class Participation 5<br>Seminar/Presentation/Assignment/Quiz/ClassTestetc. 10<br>Mid Term Exam 15<br>➢ **Practicum**<br>Class Participation<br>Seminar/Demonstration/VivaVoce/Lab Records etc.<br>Mid Term Exam: | | **End Term Examination:70**<br>Theory |

| **Part-C Learning Resources** |
|---|
| **Recommended Books/ E-Resources/ LMS:**<br>• Small scale industry- Kali Charan Gupta<br>• Small Industry the challenges of the Eighties - Ram K Vepa<br>• Industrial structure and Policy in less developed countries - C.M. Kirkpatrick<br>• Industrial Economics -R.S.Kulsheshth<br>• Industry and Rural Development- R.C. Arora<br>• Problems and Prospects of small scale industries - Vasant Desai<br>• Rural Industrialization in India - S.N. Bhattacharya |

**Department of Philosophy**
**Kurukshetra University Kurukshetra**
**Scheme of Examination and Syllabus for UG Multidisciplinary Degree Programme**
**Subject: Philosophy**
**As per National Education Policy (NEP)-2020**
**w.e.f. 2023-24**

## Scheme of Examination
## SEC-III

| Semester | Course | Paper | Nomenclature of Paper | Contact Hours | | Credits | | Internal Marks | External Marks | Total | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Theory teaching hours | Practical | Theory | Practical | | | | |
| **III** | SEC-III | B23-SEC-318 | Logical Reasoning | 2 | 2 | **2** | **1** | 20 | 55 | 75 | 3 Hrs |

| Session:2023-24 | |
|---|---|
| **Part A–Introduction** | |
| Subject | Philosophy |
| Semester | Third |
| Name of the Course | Logical Reasoning |
| Course Code | B23-SEC-318 |
| Course Type:(CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC |
| Level of the course (As per Annexure-I) | 100-199 |
| Pre-requisite for the course (if any) | N.A |

| | |
|---|---|
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to get:<br>318.1 the understanding of the nature of Proposition & Arguments.<br>318.2 the understanding of the validity and invalidity of Syllogism.<br>318.3 the understanding of Practical Guidance for Mediate and Immediate Inference<br>318.4 the understanding of Practical Guidance for Analytical Reasoning and Venn Diagrams |

| | Theory | Practical | Total |
|---|---|---|---|
| Credits | 02 | 01 | 03 |
| Contact Hours | 02 | 02 | 04 |

| | |
|---|---|
| **Max.Marks:75** | **Time: 3 hrs.** |
| **Internal Assessment Marks:20End Term Exam Marks:**55 | |

**Part B-Contents of the Course**

**<u>Instructions for Paper- Setter</u>-** Out of the Four Units, Two questions are to be set from each unit (total 8 questions are to be set), equitablydistributed over the entire unit. Question set for the Unit I & Unit II will be of theoretical nature and questions set for Unit III & Unit IV will contain at least four items of practical exercises. The examinees will have to attempt any five questions. All questions carry equal marks.

Out of Four

| | **Topics** | **Contact Hours** |
|---|---|---|
| I | Nature of Proposition<br><br>Categorical Proposition: Quality of Proposition, Quantity of Proposition, Distribution of TermsPremises, Argument and Conclusion | 7 |
| II | Validity of Categorical Syllogism: Traditional Method<br>Classical Square of Opposition: Immediate Inference—Conversion, Obversion andContraposition; Types of Paradoxes | 7 |
| III | Practical Guidance for Solving Various Types of Exercises of Mediate Inference Practical Guidance for Solving Various Types of Exercises of Immediate Inference | 8 |

| | | |
|---|---|---|
| IV | Practical Guidance for Solving Various Types of Exercises of Force-fullness of Arguments<br>Practical Guidance for Solving Various Types of Exercises of Discovering Implied Meaning ofPropositions<br>Practical Guidance for Solving Various Types of Exercises of Logical Venn Diagrams<br>Practical Guidance for Solving Various Types of Exercises of Analytical Reasoning: Verbal | 8 |
| | **Practical**<br>The examiner will set 4 questions at the time of practical examination in consideration of course learning outcomes (CLOs). The examinee will be required to solve 2 questions. The evaluation willbe done on the basis of practical record, viva-voce, written examination.<br><br>**Problem Solving:** Questions related to the following problems/exercises will be the part ofpractical exam and record will be maintained in the Practical Note Book:<br>❖ Various Kinds of Mediate Inference Problems<br>❖ Various Kinds of Immediate Inference Problems<br>❖ Exercises of Force-fullness of Arguments<br>❖ Exercises of Discovering Implied Meaning of Propositions<br>❖ Problems of Logical Venn Diagrams<br>❖ Exercises of Analytical Verbal Reasoning | 30 |
| **Suggested Evaluation Methods** | | |

| Internal Assessment: | End Term Examination: |
|---|---|
| ➢ **Theory: 15**<br>• Class Participation: **4**<br>• Seminar/presentation/assignment/quiz/ Class Test etc.: 4<br>• Mid-TermExam:**7**<br><br>➢ **Practical: 05**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/ Class Test etc.: 5<br>• Mid-Term Exam: | ➢ **Theory 35** Written Examination<br><br>➢ **Practical 20** Lab record, Viva-voce, Written examination**.** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. I. M. Copi: Introduction to Logic
2. Krishna Jain: A Text Book of Logic, D.K. Print World Ltd, New Delhi
3. R.S. Aggarwal: *A Modern Approach to Verbal & Non-Verbal Reasoning*, S. Chand & Company Ltd., RamNagar, NewDelhi.
4. Sanjay Sinha: *Test of Reasoning (Verbal & Non-Verbal)*, Jawahar Publishers, New Delhi

# KURUKSHETRA UNIVERSITYKURUKSHETRA

# Scheme of Examination and Syllabus for Under-Graduate Program Bachelor of Fine Arts (BFA)

## Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020 w.e.f. 2023-24 (in phased manner)

KURUKSHETRA UNIVERSITY KURUKSHETRA

Scheme of Examination forUnder-Graduate Programunder Multiple Entry-Exit, Internship andCBCS-LOCF in accordance to NEP-2020 w.e.f. 2023-24 (in phased manner)

**Bachelor of Fine Art (BFA): Scheme – D**

## First Year: Semester -1

| Seme Ster | Course Type | Course code | Course title | Credit Type | Credit | Contact Hours | Examination Marks | | Duration of Exam (in Hours) | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Internal | External | | |
| Sem-I | **CC-A1** (4 Credit) | B23- FAS-101 | Fundamentals of Visual Art-I | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **CC-B1** (4 Credit) | B23-FAS-102 | Drawing &Pictorial Design | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 12 | |
| | **CC-C1** (4 Credit) | B23-FAS-103 | 2D-3D Design | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 12 | |
| | **CC-M1** (2 Credit) | B23-FAS-104 | Methods & Materials -I | T | 2 | 2 | 15 | 35 | 3 | 50 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **MDC-1** (3 Credit) | From All Available MDC-1 of Three credits as per NEP | | | | | | | | |
| | **AEC-1** (2 Credit) | From All Available AEC-1 of two credits as per NEP | | | | | | | | |
| | **SEC-1** (3 Credit) | From All Available SEC-1 of three credits as per NEP | | | | | | | | |
| | **VAC-1** (2 Credit) | From All Available VAC-1 of two credits as per NEP | | | | | | | | |

**Note**- T – Theory, P- Practical

# First Year: Semester -2

| Semester | Course Type | Course code | Course title | Credit Type | Credit | Contact Hours | Examination Marks | | Duration of Exam (in Hours) | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Internal | External | | |
| Sem- II | **CC-A2** (4 Credit) | B23- FAS-201 | Fundamentals of Visual Art-II | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **CC-B2** (4 Credit) | B23-FAS-202 | Relief Printmaking | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 6 | |
| | **CC-C2** (4 Credit) | B23-FAS-203 | Sculpture | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 6 | |
| | CC-M2 (2 Credit) | B23-FAS-204 | Methods & Materials -II | T | 2 | 2 | 15 | 35 | 3 | 50 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | MDC-2 (3 Credit) | From All Available MDC-2 of Three credits as per NEP | | | | | | | | |
| | AEC-2 (2 Credit) | From All Available AEC-2 of two credits as per NEP | | | | | | | | |
| | SEC-2 (3 Credit) | From All Available SEC-2 of Three credits as per NEP | | | | | | | | |
| | VAC-2 (2 Credit) | From All Available VAC-2 of two credits as per NEP | | | | | | | | |
| **Internship of 4 Credits of 4-6 weeks duration after 2nd semester** | | | | | | | | | | |

KURUKSHETRA UNIVERSITY KURUKSHETRA

Scheme of Examination forUnder-Graduate Programunder Multiple Entry-Exit, Internship andCBCS-LOCF in accordance to NEP-2020w.e.f. 2023-24 (in phased manner)

**Bachelor of Fine Art (BFA): Scheme – D**

**SecondYear: Semester -3**

| Semester | Course Type | Course code | Course title | Credit Type | Credit | Contact Hours | Examination Marks | | Duration of Exam (in Hours) | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Internal | External | | |
| Sem-III | **CC-A3** (4 Credit) | B23- FAS-301 | History of Ancient Indian Art-I | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **CC-B3** (4 Credit) | B23-FAS-302 | Drawing | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 12 | |
| | **CC-C3** (4 Credit) | B23-FAS-303 | Composition | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 18 | |
| | **CC-M3** (4 Credit) | B23-FAS-304 | History of Early Western Art-I | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **MDC-3** (3 Credit) | From All Available MDC-3 of Three credits as per NEP | | | | | | | | |
| | **AEC-3** (2 Credit) | From All Available AEC-3 of two credits as per NEP | | | | | | | | |
| | **SEC-3** (3 Credit) | From All Available SEC-3 of Three credits as per NEP | | | | | | | | |

## Second Year: Semester -4

| Semester | Course Type | Course code | Course title | Credit Type | Credit | Contact Hours | Examination Marks | | Duration of Exam (in Hours) | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Internal | External | | |
| Sem-IV | **CC-A4** (4 Credit) | B23- FAS-401 | History of Ancient Indian Art-II | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **CC-B4** (4 Credit) | B23-FAS-402 | History of Early Western Art-II | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **CC-C4*** (4 Credit) (Choose one course title According to Subject specialization) | B23-FAS-403 | Composition Painting-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 18 | |
| | | B23-FAS-404 | Graphic Design -I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 18 | |
| | | B23-FAS-405 | Composition Sculpture-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 18 | |
| | **CC-M4 (V)*** (4 Credit) Select any One subject | B23- FAS-406 | Printmaking Composition | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 18 | |
| | | B23- FAS-407 | Press Layout & Poster Design | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 18 | |
| | | B23- FAS-408 | Relief Mural Composition | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 18 | |
| | **AEC-4** (2 Credit) | From All Available AEC-4 of two credits as per NEP | | | | | | | | |
| | **VAC-3** (2 Credit) | From All Available VAC-3 of two credits as per NEP | | | | | | | | |
| **Internship of 4 Credits after 4th semester (if not done after second semester)** | | | | | | | | | | |

* A student will opt one specialization out of three areas (i) Painting (ii) Applied Arts (iii) Sculpture and will carry that specialization from 4th Semester onwards.

KURUKSHETRA UNIVERSITY KURUKSHETRA

Scheme of Examination forUnder-Graduate Programunder Multiple Entry-Exit, Internship andCBCS-LOCF in accordance to NEP-2020w.e.f. 2023-24 (in phased manner)

**Bachelor of Fine Art (BFA): Scheme – D**

**Third Year: Semester -5**

| Semester | Course Type | Course code | Course title | Credit Type | Credit | Contact Hours | Examination Marks | | Duration of Exam (in Hours) | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Internal | External | | |
| | **CC-A5** (4 Credit) | B23-FAS-501 | History of Medieval Indian Art | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| Sem-V | **CC-B5** (4 Credit) (Choose one course title According to Subject specialization) | B23- FAS-502 | Composition Painting-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-503 | Computer Graphics-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-504 | Composition Sculpture- II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | **CC-C5** (4 Credit) (Choose one course title According to Subject specialization) | B23-FAS-505 | Printmaking –I | T | 1 | 1 | 10 | 15 | 1 | 100 |
| | | | | P | 3 | 3 | 25 | 50 | 24 | |
| | | B23-FAS-506 | Advertising Art-I | T | 1 | 1 | 10 | 15 | 1 | 100 |
| | | | | P | 3 | 3 | 25 | 50 | 12 | |
| | | B23-FAS-507 | Advance Sculpture-I | T | 1 | 1 | 10 | 15 | 1 | 100 |
| | | | | P | 3 | 3 | 25 | 50 | 24 | |
| | **CC-M5 (V)** (4 Credit) (Select any one option) | B23-FAS-508 | Portrait, Life & Nature Study-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-509 | Photography-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 18 | |
| | | B23-FAS-510 | Life Study (Portrait/Torso)-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | **Internship** (4 Credits) | **Internship of 4 credits of 4-6 weeks after 4th Semester** | | | | | | | | |

# Third Year: Semester -6

| Semester | Course Type | Course code | Course title | Credit Type | Credit | Contact Hours | Examination Marks | | Duration of Exam (in Hours) | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Internal | External | | |
| Sem-VI | **CC-A6** (4 Credit) | B23- FAS-601 | History of Medieval Western Art | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **CC-B6** (4 Credit) (Choose one course title According to Subject specialization) | B23- FAS-602 | Composition Painting-III | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-603 | Computer Graphics-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-604 | Composition Sculpture- III | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | **CC-C6** (4 Credit) (Choose one course title According to Subject specialization) | B23-FAS-605 | Portrait, Life & Nature Study-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-606 | Photography-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-607 | Life Study (Portrait/Torso)-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | **CC-M6** (4 Credit) | B23-FAS-608 | Indian Aesthetics | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **CC-M7 (V)** (4 Credit) (Choose any one Course ) | B23-FAS-609 | Printmaking –II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-610 | Advertising Art-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-611 | Advance Sculpture-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |

KURUKSHETRA UNIVERSITY KURUKSHETRA

Scheme of ExaminationforUnder-Graduate Programunder Multiple Entry-Exit, Internship andCBCS-LOCF in accordance to NEP-2020w.e.f. 2023-24 (in phased manner)

**Bachelor of Fine Art (BFA): Scheme – D**

**Fourth Year: Semester -7 (Scheme for Honours)**

| Semester | Course Type | Course code | Course title | Credit Type | Credit | Contact Hours | Examination Marks | | Duration of Exam (in Hours) | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Internal | External | | |
| Sem-VII | **CC-H1** (4 Credit) | B23- FAS-701 | History of Modern Indian Art | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **CC-H2** (4 Credit) (Choose one course title) | B23- FAS-702 | Western Aesthetics-I | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | | B23-FAS-703 | Fundamental of Advertising-I | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **CC-H3** (4 Credit) (Choose one course title According to Subject specialization) | B23-FAS-704 | Advance Painting Composition-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-705 | Advance Computer Graphics-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-706 | Life Study Sculpture (Full Figure)-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | **DSE-H1** (4 Credit) (Choose one course ) | B23-FAS-707 | Life Study-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-708 | Advance Photography-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-709 | Composition Sculpture -IV | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | **PC-H1** (4 credit) (Choose any one course title) | B23-FAS-710 | Advance Printmaking-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-711 | Product & Social Campaign Design-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-712 | Advance Sculpture Composition-I | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | **CC-HM1** (4 credit) | **From the available course as per NEP Ordinance** | | | | | | | | |

## Fourth Year: Semester -8 (Honours)

| Semester | Course Type | Course code | Course title | Credit Type | Credit | Contact Hours | Examination Marks | | Duration of Exam (in Hours) | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Internal | External | | |
| Sem-VII | **CC-H4** (4 Credit) | B23- FAS-801 | History of Modern Western Art | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **CC-H5** (4 Credit) (Choose one course title) | B23- FAS-802 | Western Aesthetics-II | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | | B23-FAS-803 | Fundamental of Advertising-II | T | 4 | 4 | 30 | 70 | 3 | 100 |
| | | | | P | 0 | 0 | 0 | 0 | 0 | |
| | **CC-H6** (4 Credit) (Choose one course title According to Subject specialization) | B23-FAS-804 | Advance Painting Composition-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-805 | Advance Computer Graphics-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-806 | Life Study Sculpture (Full Figure)-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | **DSE-H2** (4 Credit) (Choose one course ) | B23-FAS-807 | Life Study-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-808 | Advance Photography-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-809 | Composition Sculpture -V | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | **PC-H2** (4 credit) (Choose any one course title) | B23-FAS-810 | Advance Printmaking-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-811 | Product & Social Campaign Design-II | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | | B23-FAS-812 | Advance Sculpture Composition-IV | T | 0 | 0 | 0 | 0 | 0 | 100 |
| | | | | P | 4 | 4 | 30 | 70 | 24 | |
| | **CC-HM2** (4 credit) | **From the available course as per NEP Ordinance** | | | | | | | | |

# Pool Subjects - Department of Fine Art

| S.No | Semester | Course Type | Course Code | Course Title |
|---|---|---|---|---|
| **SEC SUBJECTS TO BE ADDED IN THE POOL COURSES** | | | | |
| 1 | **First** | **SEC-1** | **B23-SEC-107** | **Basic Sketching & Illustration** |
| 2 | **Second** | **SEC-2** | **B23-SEC-227** | **Advance Sketching & Illustration** |
| 3 | **Third** | **SEC-3** | **B23-SEC-327** | **Intaglio Printing** |
| | | | **B23-SEC-328** | **Graphic Design** |
| | | | **B23-SEC-329** | **Clay Modeling** |

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | First | | |
| Name of the Course | **FUNDAMENTAL OF VISUAL ART-I** | | |
| Course Code | **B23-FAS-101** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-A1 | | |
| Level of the course (As per Annexure-I | 00- 99 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. An understanding of basic principal of art & colour, concept, media and formats, and the ability to apply them to a specific aesthetic intent.<br>2. Knowledge of different element of Arts studies and continuing throughout the degree program towards the development of advance capabilities.<br>3. Understanding the basic fundamentals of arts with its merits and demerits<br>4. Progress towards developing the knowledge of consistent, personal direction and style. | | |
| Credits | Theory | Practical | Total |
| | 4 | 0 | 4 |
| Contact Hours | 4 | 0 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:** 70 | | **Time:**<br>Theory- 3 Hours | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br>(i) No. of questions to be set:09 (02 questions from each unit up to 4 units) and question no. 01 is to be set from all over the units.<br>(ii) No. of questions to be attempted : 05 , Question no. 01 is compulsory<br>(iii) All questions carry equal marks. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | **Visual arts and visual perception.**<br>Definition of art, Functions of art, Arts & Creativity, Scope of Art, Purpose of Art | 15 |
| II | **Elements of art -**<br>Line, Form, Shape, Space, Colour, Value, Texture, | 15 |
| III | **Principle of art**<br>Rhythm, Unity, Harmony, Contrast, Dominance, Balance, Perspective. | 15 |
| IV | **Classification of art**<br>Painting, Sculpture, Music, Architecture, Literature, Drama and Dance. | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory- 30**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:10<br>• Mid-Term Exam: 15<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | | **End Term Examination: Theory- 70** |
| **Part C - Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>1) BhartiyaChitra Kala kaItihas- VachaspatiGairola<br>2) BhartiyaChitrakalakaItihas- AvinashBahadurVerma<br>3) Rupaprada Kala keMuladhar- R. A. Agarwal and S. K. Sharma<br>4) BhartiyaMurtikala- Ramanath Mishra<br>5) Bhartiya Kala- A. L. Srivastava<br>6) BhartiyaChitrankan- R. K. Vishwakarma<br>7) Arts and Architecture of India- Benjamin Rowland<br>8) Indian Sculpture- Stella Kramrisch<br>9) BhartiyaChitrakalaAvemMurtikalaKaItihas- Dr. Rita Pratap10) A handbook of method & material – Ray Smith. | | |

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | First | | |
| Name of the Course | **DRAWING & PICTORIAL DESIGN** | | |
| Course Code | **B23-FAS-102** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – B1 | | |
| Level of the course (As per Annexure-I | 00-99 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Enhances the creative thoughts through studio exercise and Drawing assignments.<br>2. Understand to visual and physical control of medium used in the application of colour, Texture& tones, concepts.<br>3. Knowledge to develop drawing and painting Skills for creative composition in art.<br>4. Inculcates Emotional attachment towards nature & society | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>Practical – 12 Hours | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Drawing Techniques<br>- Understanding the importance of drawing as a fundamental skill in visual art<br>- Learning about different drawing materials and their characteristics<br>- Exploring different compositional techniques such as rule of thirds, balance, and focal point<br>- Practicing creating visually engaging and balanced compositions<br>- Practicing basic drawing techniques such as line, shading, and perspective<br>- Exploring observational drawing and still life studiesDrawing and Composition<br>- Understanding the principles of drawing and composition in visual art<br>- Learning about the elements of drawing such as line, shape, color, and texture | 15 |
| II | Advanced drawing Techniques and Style Development<br>- Exploring advanced drawing techniques such as layering, texture creation, and brushwork<br>- Learning about different drawing styles and movements in art history<br>- Practicing experimenting with different styles and developing a personal artistic voice<br>- Exploring the use of mixed media and non-traditional materials in drawing<br><br>Drawing exercises are to learn accurate observation and skills of graphic presentation in free hand drawing exercises from objects and nature to study proportion, volume and visual perspective, suggestion of solidity by line, mass, value and texture; emphasis on variety of visual experiences.<br>a) Study of proportion, line, colour, form, tone, texture and graphic representation.<br>b) Nature Drawing: study of various natural forms.<br>c) Drawing from various man-made objects.<br>d) Drawing from memory- to develop the sense of observation and the capacity to retain and recall images and their co-ordination.<br>**No. of assignments: 10 Drawings** | 15 |
| III | Pictorial Design and Composition<br>- Understanding the principles of pictorial design and composition in visual art | 15 |

| | | |
|---|---|---|
| | - Learning about the elements of design such as line, shape, color, and texture<br>- Exploring different compositional techniques such as rule of thirds, balance, and focal point<br>- Practicing creating visually engaging and balanced compositions<br>- Practicing mixing and applying paints to create a range of values, hues, and tones<br>Advanced Painting Techniques and Style Development<br>- Exploring advanced painting techniques such as layering, texture creation, and brushwork<br>- Learning about different painting styles and movements in art history<br>- Practicing experimenting with different styles and developing a personal artistic voice<br>- Exploring the use of mixed media and non-traditional materials in painting | |
| IV | Pictorial design exercises are to learn accurate observation and skills of graphic presentation in free hand drawing exercises from objects and nature to study proportion, volume and visual perspective, suggestion of solidity by line, mass, value and texture; emphasis on variety of visual experiences.<br>a) Study of proportion, line, colour, form, tone, texture and graphic representation.<br>b) Design- study of various natural forms.<br>c) Painting from memory- to develop the sense of observation and the capacity to retain and recall images and their co-ordination.<br>Painting Techniques and Color Theory<br>- Understanding color theory and its application in painting<br>- Learning about different color schemes and their emotional impact<br>- Exploring different painting techniques such as wet-on-wet, glazing, and impasto<br>**No. of Assignments: 15**<br>Still Life -5, Memory painting – 5, Landscape – 5. | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam / Submission-15 | | **End Term Examination: Practical- 70** |

| Part C - Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br>Suggested Reading-<br>1) BhartiyaChitra Kala kaItihas- VachaspatiGairola<br>2) BhartiyaChitrakalakaItihas- AvinashBahadurVerma<br>3) Rupaprada Kala keMuladhar- R. A. Agarwal and S. K. Sharma<br>4) BhartiyaMurtikala- Ramanath Mishra<br>5) Bhartiya Kala- A. L. Srivastava<br>6) BhartiyaChitrankan- R. K. Vishwakarma<br>7) Arts and Architecture of India- Benjamin Rowland<br>8) Indian Sculpture- Stella Kramrisch<br>9) BhartiyaChitrakalaAvemMurtikalaKaItihas- Dr. Rita Pratap<br>10) A handbook of method & material – Ray Smith. |

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | First | | |
| Name of the Course | **2D - 3D DESIGN** | | |
| Course Code | **B23-FAS-103** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC- C1 | | |
| Level of the course (As per Annexure-I | 00 - 99 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Fundamental theories and principals of Design as well as hands on training & practices<br>2. Acquire critical thinking skills in the development and resolution of concepts related to visual media<br>3. Understanding the relevance of design principals in historic and contemporary art & design<br>4. Ability to use calligraphy with understanding the unique qualities of artistic Concept. | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>Practical – 12 Hours | |

| Part B – Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Study of two-dimensional space and its organizational possibilities.<br>A)Elements of pictorial expression related to concepts of space and forms. Developing an Awareness of pictorial elements such as point, line, shape, volume texture, light and colour, Basic design problems.<br>B)Study of various types of objects (natural and man-made) with a view to transform them into flat pictorial images.<br>C)Developing an awareness of pictorial space-division of space form and its relation with space-observation of primitive, folk and miniature paintings as well as graphic designs.<br>D)Developing an awareness of inter-relationship of different shapes and forms -relative values.<br>E)Activation of space through form and colour - Optical illusions. | 15 |
| II | Handling of various types of material for pictorial Organization and rendering, such as:<br>Pencil, pen, brushes, water colours, poster paints, pastel crayon, inks, cellophanes, oil newsprint and other collage material, gums and adhesives, wax crayon with inks, etc.<br>A coordinated series of basis design problems with aesthetic and analytical approach. | 15 |
| III | a) Basic discipline of beautiful handwriting, sense of letter form- simultaneous judgment of the composition of letter's spacing organization - intuitive and logical planning of writing development of style.<br>b) A coordinated series of assignments of script writing with different types of traditional and modern tools. Students should be exposed to calligraphic examples of various traditional scripts. | 15 |
| IV | **Study of three-dimensional space and its organizational possibilities.**<br>a) To develop the sense of structure.<br>b) Operational problems in building up structure.<br>c) Gravitational and mechanical principles.<br>d) Principles of composition and the study of the principles that hold the structure. | 15 |

| | | |
|---|---|---|
| | e) Simple assignments in organizing various units through: Symmetrical load bearing structure Cantilever construction. Flexibility and ability to stretch Geometrical regularity Arched structure. Control of tensions Hinge construction.<br>f) Expanding structure through unit etc. Experiments through various types of material and their combinations such as:-<br>Paper, cardboard, wood block, wire, clay, plasticine, plaster of Paris, metal sheets, plastic form<br>Thermo-cole, string, gums and adhesives, wax found objects etc.<br>**Types:** 1. Carved 2.Modeled. 3. Perforated (bored through) 4. Mobile. 5. Various methods of joining such as Interlocking, pasting etc.<br>**No. of assignments: 15**<br>2-D Design: 10<br>3-D Design: 5 | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam / Submission-15 | **End Term Examination: Practical- 70** |

**Part C - Learning Resources**

**Recommended Books/e-resources/LMS:**


1. "The Elements of Typographic Style" by Robert Bringhurst
2. "Thinking with Type: A Critical Guide for Designers, Writers, Editors, & Students" by Ellen Lupton
3. "Calligraphy for Dummies" by Jim Bennett
4. "The Calligrapher's Bible: 100 Complete Alphabets and How to Draw Them" by David Harris
5. "Calligraphy: A Complete Guide to the Art of Lettering" by Julien Chazal
6. "Learning Calligraphy: An Essential Workbook for Beginners" by Mary Noble and Eleanor Winters
7. "Mastering Copperplate Calligraphy: A Step-by-Step Manual" by Eleanor Winters
8. "Designing with Type: The Essential Guide to Typography" by James Craig and Irene KorolScala
9. "The Non-Designer's Design Book" by Robin Williams
10. "Layout Workbook: A Real-World Guide to Building Pages in Graphic Design" by Kristin Cullen
11. "The Geometry of Type: The Anatomy of 100 Essential Typefaces" by Stephen Coles
12. "Grid Systems in Graphic Design: A Visual Communication Manual for Graphic Designers, Typographers, and Three Dimensional Designers" by Josef Müller-Brockmann
13. "Typography Sketchbooks" by Steven Heller and LitaTalarico
14. "3D Typography: Creating Letterforms in Three Dimensions" by Jeanette Abbink and Emily CM Anderson
15. "Mastering Type: The Essential Guide to Typography for Print and Web Design" by Denise Bosler
16. "101 Things I Learned in Architecture School" by Matthew Frederick
17. "Graphic Design: The New Basics" by Ellen Lupton and Jennifer Cole Phillips
18. "Design Elements: Color Fundamentals" by AarisSherin
19. "Typography Workbook: A Real-World Guide to Using Type in Graphic Design" by Timothy Samara
20. "Calligraphy and Lettering: A Maker's Guide" by Samantha Warren

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | First | | |
| Name of the Course | **METHODS & MATERIALS-I** | | |
| Course Code | **B23- FAS- 104** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M1 | | |
| Level of the course (As per Annexure-I | 100 - 199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the basic fundamental of drawing materials for creating Art.<br>2. Enhances the confidence to use art materials with appropriate concept.<br>3. Study and knowledge of about different ingredients & contents in art materials<br>4. Develop scientific approaches & skills | | |
| Credits | Theory | Practical | Total |
| | 2 | 0 | 2 |
| Contact Hours | 2 | 0 | 2 |
| **Max. Marks:50**<br>**Internal Assessment Marks:15**<br>**End Term Exam Marks:**35 | | **Time:3 hrs** | |

**Part B - Contents of the Course**

**Instructions for Paper- Setter**

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Importance of Methods and Materials, Nature and Characteristics of Drawing and Painting medium such as pencil, crayon, charcoal, pastel, pen and ink, Types of Brushes. Drying oils, | 7 |

| | | |
|---|---|---|
| | thinners and siccative's. Practical: Mounting and Pasting of Art Works/ coating surface on paper etc | |
| II | Preparation of canvas, Stretching, Priming, Sizing & Preparation of other ground surfaces for the paintings.<br>Preservation, Restoration methods & techniques of Art works. Photography: Manual & Digital, New Media- Video, Sound etc, | 7 |
| III | Types of Papers – Hot Press & Cold Press papers, Handmade – Machine made<br>Technique of Water colour (Opaque &Transparent), Wash Technique, Gouache, Tempera and oil paint, Gums and glues, Resin and Varnishes | 8 |
| IV | Print making methods- Silk-screen, Etching- Mezzotint, Aquatint, Lithography, wood-cut, Lino cut<br>Computer Soft wares & Hardware like Photoshop & Coral Draw. | 8 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory- 15**<br>• Class Participation: 04<br>• Seminar/presentation/assignment/quiz/class test etc.:04<br>• Mid-Term Exam: 07<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | **End Term Examination: 35** |

**Part C - Learning Resources**

**Recommended Books/e-resources/LMS:**

(i) 1. The Art of Painting, by Jan Vermeer
(ii) 2. Notes on Color, by Johannes Itten
(iii) 3. Composition of Outdoor Painting, by Edgar Payne
(iv) 4. Oil Painting Techniques and Materials, by Harold Speed
(v) 5. The Practice and Science of Drawing, by Harold Speed
(vi) 6. The Natural Way to Draw, by KimonNicolaides
(vii) 7. The Elements of Drawing, by John Ruskin
(viii) 8. Mural Painting Techniques, by Manuel Neri
(ix) 9. Mural Magic: Painting Murals in Children's Bedrooms, by Shelly Burton
(x) 10. The Techniques of Painting Miniatures, by Sue Burton
(xi) 11. Painting Clouds and Skies, by Ted Goerschner
(xii) 12. The Techniques of Painting Seascapes, by Ian King
(xiii) 13. Printmaking in the Sun, by Dan Welden and Pauline Muir
(xiv) 14. Lithography, by George Bellows
(xv) 15. The Complete Printmaker, by John Ross and Clare Romano
(xvi) 16. Sculpture: Some Observations on Shape and Form from Pygmalion's Creative Dream, by Wilhelm Worringer
(xvii) 17. The Technique of Sculpture, by Antony Gormley
(xviii) 18. Modeling and Sculpting the Figure, by EdouardLanteri
(xix) 19. The Art of Carving: A Guide to a Life-Sustaining Skill, by David Calvo
(xx) 20. Metalworking: A Complete Guide to Dimensioning, Design, and Technical Drawing, by Harold Hall.

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Second | | |
| Name of the Course | **FUNDAMENTAL OF VISUAL ART-II** | | |
| Course Code | **B23-FAS-201** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC- A2 | | |
| Level of the course (As per Annexure-I | 00- 99 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1.Knowledge about the Indian Folk Art, Culture & Folk traditions, their relations, and differences.<br>2.Student came to know the differences between Indian Art Forms & their Motifs<br>3.Knowledge of different Design forms, Function of designs, How, Where, and Why to use in Art with tools and techniques.<br>4.Enhances the value of Indian culture &Patriotism. | | |
| Credits | Theory | Practical | Total |
| | 4 | 0 | 4 |
| Contact Hours | 4 | 0 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:** 70 | | **Time:**<br>Theory- 3 Hours | |
| **Part B - Contents of the Course** | | | |

**<u>Instructions for Paper- Setter</u>**

(i) No. of questions to be set:09 (02 questions from each unit up to 4 units) and question no. 01 is to be set from all over the units.

(ii) No. of questions to be attempted : 05 , Question no. 01 is compulsory

(iii) All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | 1 Meaning and Definition of Folk art their characteristic.<br>2 Classification of Folk Arts in India - Madhubani, Warli, Pat Chitra, Sanjhi, Phad Chitra | 15 |
| II | Meaning & comparative Study of Classical Art, Traditional Art , Craft Works , Tribal Art, Folk Art. | 15 |
| III | Visual elements and the elements of design their characteristics and behavior.<br>1 Meaning of Design<br>2 Design thorough nature<br>3Interior design , Fashion design, Textile design,<br>4 Furniture design, Jewelry design, Graphic Design | 15 |
| IV | Study on different types of dimensions in Art, Basic principles, their application of various media of Dimensional Art.<br>1 Dimension in art -2D<br>2 Dimension in art- 3D | 15 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory- 30**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.: 10<br>• Mid-Term Exam: 15<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | **End Term Examination: Theory- 70** |

**Part C - Learning Resources**

**Recommended Books/e-resources/LMS:**

1) BhartiyaChitra Kala kaItihas- VachaspatiGairola
2) BhartiyaChitrakalakaItihas- AvinashBahadurVerma
3) Rupaprada Kala keMuladhar- R. A. Agarwal and S. K. Sharma
4) BhartiyaMurtikala- Ramanath Mishra
5) Bhartiya Kala- A. L. Srivastava
6) BhartiyaChitrankan- R. K. Vishwakarma
7) Arts and Architecture of India- Benjamin Rowland
8) Indian Sculpture- Stella Kramrisch
9) BhartiyaChitrakalaAvemMurtikalaKaItihas- Dr. Rita Pratap10) A handbook of method & material – Ray Smith.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Second | | |
| Name of the Course | **RELIEF PRINT MAKING** | | |
| Course Code | **B23-FAS-202** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – B2 | | |
| Level of the course (As per Annexure-I | 00 - 99 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Develop Artistic Ability with tools, materials and techniques inherent to basic printmaking processes.<br>2. Knowledge of solving visual problems with equal emphasis on combining both concept and physical process of printmaking.<br>3. Understand and discuss the historical and contemporary role of printmaking media in art, design & culture building.<br>4. Enhances the knowledge of Indian print culture & tradition. | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:** 70 | | **Time:**<br>Practical – 6 Hours | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Fundamentals of various methods of taking Relief print. | 15 |
| II | Observation of intrinsic texture of various surfaces and the textures of natural and man-made things. Experience of Hand printing with wood blocks, Methods of inking on block. | 15 |
| III | Introduction of materials and its use for making a design for a relief print. Making relief print by wood block and<br>Linoleum block | 15 |
| IV | Techniques of taking prints in: - Single colour or Double colour.<br>Experience of printing of different types of surfaces: Different papers & Various types of fabrics (cloth)<br>Practical Syllabus<br>Based on above given details<br>No. of Assignments: 6 | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam / Submission:15 | | **End Term Examination: Practical- 70** |
| **Part C - Learning Resources** | | |

**Recommended Books/e-resources/LMS:**


1. The Complete Printmaker by John Ross and Clare Romano
2. Printmaking: A Contemporary Art Form by Paul Coldwell
3. The Printmaking Bible: The Complete Guide to Materials and Techniques by Ann D'Arcy Hughes and Hebe Vernon-Morris
4. Mastering the Art of Printmaking by Wendy Stayman
5. Printmaking Handbook: Intaglio Techniques by Anne Desmet and Jim Anderson
6. Printmaking in the Sun by Dan Welden and Pauline Muir
7. Making Woodblock Prints by Merlyn Chesterman and Rod Nelson
8. The Art of Printmaking by Stan Smith
9. Japanese Prints: The Art of Masterpieces by MatthiForrer and Shinichi Segi
10. The Printmaker's Handbook: The Techniques of Lithography by Bill Ritchie


*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Second | | |
| Name of the Course | **SCULPTURE** | | |
| Course Code | **B23-FAS - 203** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – C2 | | |
| Level of the course (As per Annexure-I | 00 - 99 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Knowledge to manipulate, integrate and use material to build three dimensional sculptures.<br>2. Understand to research form, materials and techniques as need by the direction of their sculptural work.<br>3. Ability to use geometry, calligraphy with understanding the unique qualities of artistic Concept..<br>4. Enhance the belongingness towards mother earth, calculative, scientific & analytical strength. | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:** 70 | | **Time:**<br>**Practical- 6 Hours** | |
| **Part B - Contents of the Course** | | | |
| **Instructions for Paper- Setter** | | | |
| **Unit** | **Topics** | | **Contact Hours** |
| I | **Courses of study;** | | 15 |

| | | |
|---|---|---|
| | Learning to see, experience and study of natural or manmade objects involving perception, analysis of perceptual elements and understanding of their relationships. | |
| II | Learning to work in round-Natural or man-made objects, in relief most familiar areas of contact. | 15 |
| III | Introduction to sculpture-basic elements and their relationships-Sculptural exercises based on studies from nature, human figures or other areas of contact. | 15 |
| IV | Exercises in sculptural expression-manipulation of space and volumes using different materials.<br>Practical Syllabus –<br>Assignments Based on Above Given Details<br>**No. of assignments: 6**<br>**Medium:** Clay, Plaster of Paris, Paper, metal foil sheet etc | 15 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam / Submission: 15 | **End Term Examination: 70** |

**Part C - Learning Resources**

**Recommended Books/e-resources/LMS:**


1) BhartiyaChitra Kala kaItihas- VachaspatiGairola
2) BhartiyaChitrakalakaItihas- AvinashBahadurVerma
3) Rupaprada Kala keMuladhar- R. A. Agarwal and S. K. Sharma
4) BhartiyaMurtikala- Ramanath Mishra
5) Bhartiya Kala- A. L. Srivastava
6) BhartiyaChitrankan- R. K. Vishwakarma
7) Arts and Architecture of India- Benjamin Rowland
8) Indian Sculpture- Stella Kramrisch
9) BhartiyaChitrakalaAvemMurtikalaKaItihas- Dr. Rita Pratap
10) A handbook of method & material – Ray Smith.
Sculpture: Some Observations on Shape and Form from Pygmalion's Creative Dream, by Wilhelm Worringer
11) The Technique of Sculpture, by Antony Gormley
12) Modeling and Sculpting the Figure, by EdouardLanteri
13) The Art of Carving: A Guide to a Life-Sustaining Skill, by David Calvo
14) Metalworking: A Complete Guide to Dimensioning, Design, and Technical Drawing, by Harold Hall.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Second | | |
| Name of the Course | **METHODS & MATERIALS -II** | | |
| Course Code | **B23 – FAS- 204** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M2 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Integrate the course wide materials requirement to develop an overall artistic knowledge.<br>2. Knowledge about the application of various material working method and inventory controlling techniques into practice<br>3. Inculcate the professional artistic development, attitude, higher – order thinking skills.<br>4. Enhance to understand the basic Artistic development theory. | | |
| Credits | Theory | Practical | Total |
| | 2 | 0 | 2 |
| Contact Hours | 2 | 0 | 2 |
| **Max. Marks: 50**<br>**Internal Assessment Marks: 15**<br>**End Term Exam Marks:35** | | **Time: 3hrs** | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Study of various media like clay, ceramic, wood, cement, plaster of perish etc. and techniques employed in creative sculpture (including molding and casting) | 7 |
| II | Coloring and finishing of plaster, Cement and Wood sculptures and firing of terracotta, pottery and ceramic. | 7 |
| III | Study of various stone, marble and metals for casting and fabrication like aluminum, bronze, copper, mild steel etc. | 8 |
| IV | Mural Work, Types of Mural (Direct & Indirect Mural Techniques), Method & Material use for Mural Making | 8 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory- 15**<br>• Class Participation: 04<br>• Seminar/presentation/assignment/quiz/class test etc.: 04<br>• Mid-Term Exam: 07<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | | **End Term Examination: 35** |
| **Part C - Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br><br>A handbook of method and Material – Ray Smith<br>Sculpture: Principles and Practice" by Louis Slobodkin<br>Materials, Methods, and Masterpieces of Medieval Art" by Janetta Rebold Benton<br>Sculpture: Techniques in Clay, Wax, Slate" by Peter King<br>Materials and Techniques in Art" by Ralph Mayer<br>Sculpture Techniques" by John Plowman<br>The Complete Book of Sculpture Techniques" by John W. Mills | | |

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Third | | |
| Name of the Course | **HISTORY OF ANCIENT INDIAN ART-I** | | |
| Course Code | **B23-FAS- 301** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – A3 | | |
| Level of the course (As per Annexure-I | 100 - 199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1.Study of Indian art to understand our cultural heritage.<br>2. Enhances the knowledge of development in art & tradition.<br>3.Understanding the Value of Indian scriptures & Vedic philosophies.<br>4. Understand the Development of different ideologies & influences in Indian Art | | |
| Credits | Theory | Practical | Total |
| | 4 | 0 | 4 |
| Contact Hours | 4 | 0 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>Theory- 3 Hours | |
| **Part B - Contents of the Course** | | | |

**Instructions for Paper- Setter**

(i) No. of questions to be set:09 (02 questions from each unit up to 4 units) and question no. 01 is to be set from all over the units.

(ii) No. of questions to be attempted : 05 , Question no. 01 is compulsory

(iii) All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Importance of prehistoric cave painting.<br>Medium and Subject of cave painting. | 15 |
| II | Pre-historical art<br>Cave painting at Bhimbetka, Mirjapur, Hoshangabad, Panchmadhi. Jogimara Cave, | 15 |
| III | **Proto-Historic Art:**<br>Indus valley civilization - Harappa and Mohenjodaro. | 15 |
| IV | Different types of Architecture, Sculpture and Painting.<br>ie: Priest, Dancing girl, Seals & coins, Terracotta sculpture, Mother Goddess figurines. | 15 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory - 30**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:10<br>• Mid-Term Exam: 15<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | **End Term Examination: Theory – 70** |

**Part C - Learning Resources**

**Recommended Books/e-resources/LMS:**


1) BhartiyaChitra Kala kaItihas- VachaspatiGairola
2) BhartiyaChitrakalakaItihas- AvinashBahadurVerma
3) Rupaprada Kala keMuladhar- R. A. Agarwal and S. K. Sharma
4) BhartiyaMurtikala- Ramanath Mishra
5) Bhartiya Kala- A. L. Srivastava
6) BhartiyaChitrankan- R. K. Vishwakarma
7) Arts and Architecture of India- Benjamin Rowland
8) Indian Sculpture- Stella Kramrisch
9) BhartiyaChitrakalaAvemMurtikalaKaItihas- Dr. Rita Pratap


*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Third | | |
| Name of the Course | **DRAWING** | | |
| Course Code | **B23-FAS - 302** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – B3 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Enhances the creative thoughts through studio exercise and Drawing assignments.<br>2. Understand to visual and physical control of medium used in the application of colour, Texture& tones, concepts.<br>3. Knowledge to develop drawing and painting Skills for creative composition in art.<br>4. Inculcates Emotional attachment towards nature & society | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>**Practical - 12 Hours** | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Drawing Techniques<br>- Understanding the importance of drawing as a fundamental skill in visual art<br>- Learning about different drawing materials and their characteristics<br>- Practicing basic drawing techniques such as line, shading, and perspective | 15 |
| II | - Exploring different compositional techniques such as rule of thirds, balance, and focal point<br>- Practicing creating visually engaging and balanced compositions<br>- Practicing basic drawing techniques such as line, shading, and perspective<br>- Exploring observational drawing and still life studiesDrawing and Composition<br>- Understanding the principles of drawing and composition in visual art<br>- Learning about the elements of drawing such as line, shape, color, and texture | 15 |
| III | Advanced drawing Techniques and Style Development<br>- Exploring advanced drawing techniques such as layering, texture creation, and brushwork<br>- Learning about different drawing styles and movements in art history<br>- Practicing experimenting with different styles and developing a personal artistic voice<br>- Exploring the use of mixed media and non-traditional materials in drawing<br><br>Drawing exercises are to learn accurate observation and skills of graphic presentation in free hand drawing exercises from objects and nature to study proportion, volume and visual perspective, suggestion of solidity by line, mass, value and texture; emphasis on variety of visual experiences.<br>e) Study of proportion, line, colour, form, tone, texture and graphic representation.<br>f) Nature Drawing: study of various natural forms.<br>g) Drawing from various man-made objects.<br>h) Drawing from memory- to develop the sense of observation and the capacity to retain and recall images and their co-ordination. | 15 |

| | | |
|---|---|---|
| IV | Drawing exercises are to learn accurate observation and skills of graphic presentation in free hand drawing exercises from objects and nature to study proportion, volume and visual perspective, suggestion of solidity by line, mass, value and texture; emphasis on variety of visual experiences.<br>a) Study of proportion, line, colour, form, tone, texture and graphic representation.<br>b) Nature Drawing: study of various natural forms.<br>c) Drawing from various man-made objects.<br>d) Drawing from memory- to develop the sense of observation and the capacity to retain and recall images and their co-ordination.<br>**No. of Assignments: 10**<br>Still Life -2, Memory Drawing – 2, Landscape – 3. Head Study- 3 | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam / Submission: 15 | | **End Term Examination: 70** |
| **Part C - Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>Suggested Reading-<br>1) BhartiyaChitra Kala kaItihas- VachaspatiGairola<br>2) BhartiyaChitrakalakaItihas- AvinashBahadurVerma<br>3) Rupaprada Kala keMuladhar- R. A. Agarwal and S. K. Sharma<br>4) BhartiyaMurtikala- Ramanath Mishra<br>5) Bhartiya Kala- A. L. Srivastava<br>6) BhartiyaChitrankan- R. K. Vishwakarma<br>7) Arts and Architecture of India- Benjamin Rowland<br>8) Indian Sculpture- Stella Kramrisch<br>9) BhartiyaChitrakalaAvemMurtikalaKaItihas- Dr. Rita Pratap | | |

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Third | | |
| Name of the Course | **COMPOSITION** | | |
| Course Code | **B23 –FAS- 303** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – C3 | | |
| Level of the course (As per Annexure-I | 100 - 199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Imparting knowledge with Practical Assignments on Indian Traditional Miniature art.<br>2.Enhancing the skill of using colours and compositional values.<br>3.Increase patience and philosophical values through art.<br>4.Improves emotional intelligence by using colour& forms. | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks:100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>Practical – 18 Hours | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Painting, Applied & Sculpture Composition:<br>- Understanding the basics of composition.<br>- Learning about the principles of design (balance, unity, contrast, etc.)<br>- Exploring different types of compositions (symmetrical, asymmetrical, rule of thirds, etc.)<br>- Studying the use of color, value, and texture in composition | 15 |
| II | Traditional Techniques in Composition<br>- Learning classical techniques like chiaroscuro and glazing<br>- Exploring the golden ratio and its application in composition<br>- Studying the use of leading lines, focal points, and visual hierarchy in compositions<br>- Analyzing and discussing famous artworks with strong compositions | 15 |
| III | Contemporary Approaches in Design & Composition<br>- Understanding abstract and non-representational composition<br>- Experimenting with unconventional compositions and breaking traditional rules<br>- Exploring the use of negative space and unconventional color schemes<br>- Studying the works of modern and contemporary artists known for their innovative compositions | 15 |
| IV | Narration Through 2D & 3D Composition<br>- Developing storytelling through composition<br>- Understanding the psychological impact of composition on the viewer<br>- Exploring expressive composition techniques through brushwork, mark-making, and texture<br>- Experimenting with symbolism, Visual Communication and visual metaphors in compositions<br>**No. of assignments: 10** | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam / Submission: 15 | **End Term Examination: Practical- 70** |

| Part C - Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br>1. Composition: Understanding Line, Notan, and Color by Arthur Wesley Dow<br>2. Elemental Composition: Making Sense of the 12 Elements of Art by Eileen S. Prince<br>3. Creative Composition: Digital Painting Techniques Using Adobe Photoshop by John A. Parks<br>4. Composition of Outdoor Painting by Edgar Payne<br>5. The Principles of Composition in Photography by Brian Peterson<br>6. Composition: From Snapshots to Great Shots by Laurie Excell<br>7. Composition: A Painter's Guide to Basic Principles by William F. Powell<br>8. Composition for Outdoor Painting by Richard McKinley<br>9. Composition: Understanding Composition in Art and Photography by Graham Battams<br>10. The Elements of Landscape Oil Painting: Techniques for Rendering Sky, Terrain, Trees, and Water by Suzanne Brooker<br>11. Perspective, Composition, Color and Value: Strategies and Inspiration for Better Coastal Paintings by Thanos Zaharopoulos<br>12. Composition for the 21st Century by Frank Lisa<br>13. The Elements of Visual Style: The Basics of Print Design for Every Job by Robert W. Harris<br>14. Painting the Landscape in Watercolor: A Simplified Approach to Composition by Buck Paulson<br>15. Creative Composition Toolbox: Tips, Tricks, and Techniques for More Creative and Successful Photography by Michelle Perkins<br>16. Finding Your Visual Voice: A Painting Composition Book by Dakota Sexton<br>17. Composition for Metalwork by Tim McCreight<br>18. Painting with Composition in Mind: A Guide to Finding Your Own Visual Voice by Courtney Jordan<br>19. Artful Color, Mindful Composition: Color and Composition for Artists and Crafters by Judith Baker Montano<br>20. Composition for Beginners: Practical Skills to Learn in 30 Days or Less by Julia Diego |

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Third | | |
| Name of the Course | **HISTORY OF EARLY WESTERN ART- I** | | |
| Course Code | **B23-FAS- 304** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – M3 | | |
| Level of the course (As per Annexure-I | 100 - 199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | (i) Understand the developments of world Art from initial stages.<br>(ii) Knowledge of Distinguish between art historical periods.<br>(iii) Sharpen ability to critically analyze visual art from a stylistic, cultural, ethical, and political perspective.<br>(iv) Inculcate the tradition, location, period, resources and techniques in cultures of European Art. | | |
| Credits | Theory | Practical | Total |
| | 4 | 0 | 4 |
| Contact Hours | 4 | 0 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>Theory- 3 Hours | |
| **Part B - Contents of the Course** | | | |

**<u>Instructions for Paper- Setter</u>**

(i) No. of questions to be set:09 (02 questions from each unit up to 4 units) and question no. 01 is to be set from all over the units.

(ii) No. of questions to be attempted : 05 , Question no. 01 is compulsory

(iii) All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Introduction to pre-historic art:**<br>The old stone age: Altamira, Lascaux, Venus of Willendrop.<br>The new stone age: Stonehenge[aerial view]. | 15 |
| II | **The study of Egyptian art:**<br>The old Kingdom – Pyramid of king Zoser, The pyramids of Mycerinus, Giza -The great Sphinx. | 15 |
| III | **The study of Eastern art, Aegean art and Greek art.**<br>**Eastern art:**<br>Sumerian art- The white temple [Ziggurat]; Status, from the Abu temple; Ram & Tree.<br>**Aegean art:**<br>Minoan art- The Queen Megaron [Knossos] | 15 |
| IV | **Greek art:** Painting [Geometric style, Oriental zing style] ; Temple [Doric, Ionic] | 15 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory- 30**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:10<br>• Mid-Term Exam: 15<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | **End Term Examination: Theory – 70** |

**Part C - Learning Resources**

**Recommended Books/e-resources/LMS:**

1. Razanl, Modern Paining, Skira – Useful references from plates and text.
2. Lake and Maillard – Dictionary of Modern Painting.
3. Herbert Road – A concise History of Modern Paining.
4. William Vaughan – Romantic Art.
5. European Modern Movements in Encyclopedia of World Art.
6. Leymarie – Impressionism (Skira).
7. J. Rewald – History of impressionism – Museum of Modern Art, New York.
8. J. Rewald – Post Impressionism (Both these books are indispensable for the respective periods).
9. Roger Fry – Vision and Design.
10. Madsen – Art Nouveau.

**SCULPTURE:**

11. Herbert Read : (i) Modern Sculpture.
12. Herbert Read : (ii) Art of Sculpture.
13. Giedion Welcker : Contemporary Sculpture.
14. Sculpture of the 19th – 20th Centuries.

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Fourth | | |
| Name of the Course | **HISTORY OF ANCIENT INDIAN ART-II** | | |
| Course Code | **B23-FAS- 401** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – A4 | | |
| Level of the course (As per Annexure-I | 100 - 199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1.Study of Indian art to understand our cultural heritage.<br>2. Enhances the knowledge of development in art & tradition.<br>3.Understanding the Value of Indian scriptures & Vedic philosophies.<br>4. Understand the Development of different ideologies & influences in Indian Art | | |
| Credits | Theory | Practical | Total |
| | 4 | 0 | 4 |
| Contact Hours | 4 | 0 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>Theory- 3 Hours | |
| **Part B - Contents of the Course** | | | |

**Instructions for Paper- Setter**

(i) No. of questions to be set:09 (02 questions from each unit up to 4 units) and question no. 01 is to be set from all over the units.

(ii) No. of questions to be attempted : 05 , Question no. 01 is compulsory

(iii) All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | The Vedic & Upanishad Period<br>Study of Evidence found in this period, Indo Aryan Culture, Mahakavya period | 15 |
| II | **Mauryan Art :**<br>Importance sculpture of the Mauryanperiod : Lion capital [Sarnath] , Sarnath stupa , Didarganjyakshini, parkhamyaksha. | 15 |
| III | The study of stupa sculpture:Bharahut, Sanchi, Amaravati, Nagarjunkonda.<br>Early Buddhist stupas and their architectural elements.<br>Development of stupas in different regions and time periods.<br>Architectural Features of Stupas:<br>Variations in stupa architecture across different Buddhist traditions and cultures.<br>Carvings and sculptures on stupas depicting Buddhist stories and motifs.<br>Analysis of art styles and techniques used in decorating stupas. | 15 |
| IV | Kushan Period – Mathura & Gandhara<br>Historical and Geographical Context:<br>Introduction to the Gandhara region and its historical significance.<br>Interaction of Gandharan culture with neighboring civilizations.<br>Gandhara Art and Sculptures:<br>Stylistic analysis of Gandharan sculptures, focusing on Buddha figures and other deities. | 15 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory - 30**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:10<br>• Mid-Term Exam: 15<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | **End Term Examination: Theory – 70** |

**Part C - Learning Resources**

**Recommended Books/e-resources/LMS:**


1) BhartiyaChitra Kala kaItihas- VachaspatiGairola
2) BhartiyaChitrakalakaItihas- AvinashBahadurVerma
3) Rupaprada Kala keMuladhar- R. A. Agarwal and S. K. Sharma
4) BhartiyaMurtikala- Ramanath Mishra
5) Bhartiya Kala- A. L. Srivastava
6) BhartiyaChitrankan- R. K. Vishwakarma
7) Arts and Architecture of India- Benjamin Rowland
8) Indian Sculpture- Stella Kramrisch
9) BhartiyaChitrakalaAvemMurtikalaKaItihas- Dr. Rita Pratap


*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Fourth | | |
| Name of the Course | **HISTORY OF EARLY WESTERN ART- II** | | |
| Course Code | **B23-FAS- 402** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – B4 | | |
| Level of the course (As per Annexure-I | 100 - 199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | (i) Understand the developments of world Art from initial stages.<br>(ii) Knowledge of Distinguish between art historical periods.<br>(iii) Sharpen ability to critically analyze visual art from a stylistic, cultural, ethical, and political perspective.<br>(iv) Inculcate the tradition, location, period, resources and techniques in cultures of European Art. | | |
| Credits | Theory | Practical | Total |
| | 4 | 0 | 4 |
| Contact Hours | 4 | 0 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>Theory- 3 Hours | |
| **Part B - Contents of the Course** | | | |

**<u>Instructions for Paper- Setter</u>**

(i) No. of questions to be set:09 (02 questions from each unit up to 4 units) and question no. 01 is to be set from all over the units.

(ii) No. of questions to be attempted : 05 , Question no. 01 is compulsory

(iii) All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **The study of Roman sculptures and painting.**<br>**The study of Early Christian period.**<br>1 Roman sculptures and paintings.<br>2 Early Christian: Catacombs, Mosaics. | 15 |
| II | **Byzantine art:**<br>Characteristics of Byzantine architecture, including domes, pendentives, and basilica plans.<br>Famous Byzantine architectural wonders like Hagia Sophia in Constantinople (modern-day Istanbul).<br>Importance of mosaics in Byzantine art and architecture.<br>Techniques and themes depicted in Byzantine mosaics, often religious and imperial in nature. | 15 |
| III | **The study of Romanesque period**<br>**Romanesque:** Cathedral and Campanile; Sculpture [Apostle] and Painting [ The battle of Hastings, St. John the Evangelist]. | 15 |
| IV | **The Study of Gothic period:**<br><br>Development and characteristics of Gothic architecture, including pointed arches, ribbed vaults, and flying buttresses.<br>Sculptural elements and styles in Gothic architecture, including gargoyles, grotesques, and tympanums.<br>Importance of stained glass windows in Gothic architecture.<br>Techniques used in creating intricate stained glass designs and their religious symbolism.<br>Development of Gothic painting, including manuscript illumination and panel paintings. | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory- 30**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:10<br>• Mid-Term Exam: 15<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | | **End Term Examination: Theory – 70** |

## Part C - Learning Resources

### Recommended Books/e-resources/LMS:


1. Razanl, Modern Paining, Skira – Useful references from plates and text.
2. Lake and Maillard – Dictionary of Modern Painting.
3. Herbert Road – A concise History of Modern Paining.
4. William Vaughan – Romantic Art.
5. European Modern Movements in Encyclopedia of World Art.
6. Leymarie – Impressionism (Skira).
7. J. Rewald – History of impressionism – Museum of Modern Art, New York.
8. J. Rewald – Post Impressionism (Both these books are indispensable for the respective periods).
9. Roger Fry – Vision and Design.
10. Madsen – Art Nouveau.
11. Deymatie : Fauvism (good introduction also in Encyclopedia of World Art.)
12. Crespelle – The Fauves.
13. Golding – Cubism: A history and analysis – See Also : Cubism and Futurism in Encyclopeadia of World Art.
14. Rosenblum – Cubism and 20th Century Art.
15. Selz : German Expressionism. For Expressionism See Also Encyclopeadia of World Art.

**SCULPTURE:**

16. Herbert Read : (i) Modern Sculpture.
17. Herbert Read : (ii) Art of Sculpture.
18. Giedion Welcker : Contemporary Sculpture.
19. Sculpture of the 19th – 20th Centuries.


*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Fourth | | |
| Name of the Course | **COMPOSITION PAINTING -I** | | |
| Course Code | **B23 –FAS- 403** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – C4 | | |
| Level of the course (As per Annexure-I | 100 - 199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Imparting knowledge with Practical Assignments on Indian Traditional Miniature art.<br>2.Enhancing the skill of using colours and compositional values.<br>3.Increase patience and philosophical values through art.<br>4.Improves emotional intelligence by using colour& forms. | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks:100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>Practical – 18 Hours | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Painting Composition<br>- Understanding the basics of composition in painting<br>- Learning about the principles of design (balance, unity, contrast, etc.)<br>- Exploring different types of compositions (symmetrical, asymmetrical, rule of thirds, etc.)<br>- Studying the use of color, value, and texture in composition | 15 |
| II | Traditional Techniques in Painting Composition<br>- Learning classical techniques like chiaroscuro, and glazing<br>- Exploring the golden ratio and its application in composition<br>- Studying the use of leading lines, focal points, and visual hierarchy in compositions<br>- Analyzing and discussing famous artworks with strong compositions | 15 |
| III | Contemporary Approaches in Painting Composition<br>- Understanding abstract and non-representational composition<br>- Experimenting with unconventional compositions and breaking traditional rules<br>- Exploring the use of negative space and unconventional color schemes<br>- Studying the works of modern and contemporary artists known for their innovative compositions | 15 |
| IV | Expressive and Narrative Composition<br>- Developing storytelling through painting composition<br>- Understanding the psychological impact of composition on the viewer<br>- Exploring expressive composition techniques through brushwork, mark-making, and texture<br>- Experimenting with symbolism and visual metaphors in compositions<br>**No. of assignments: 10** | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam / Submission: 15 | | **End Term Examination: Practical- 70** |

## Part C - Learning Resources

**Recommended Books/e-resources/LMS:**

1. Composition: Understanding Line, Notan, and Color by Arthur Wesley Dow
2. Elemental Composition: Making Sense of the 12 Elements of Art by Eileen S. Prince
3. Creative Composition: Digital Painting Techniques Using Adobe Photoshop by John A. Parks
4. Composition of Outdoor Painting by Edgar Payne
5. The Principles of Composition in Photography by Brian Peterson
6. Composition: From Snapshots to Great Shots by Laurie Excell
7. Composition: A Painter's Guide to Basic Principles by William F. Powell
8. Composition for Outdoor Painting by Richard McKinley
9. Composition: Understanding Composition in Art and Photography by Graham Battams
10. The Elements of Landscape Oil Painting: Techniques for Rendering Sky, Terrain, Trees, and Water by Suzanne Brooker
11. Perspective, Composition, Color and Value: Strategies and Inspiration for Better Coastal Paintings by ThanosZaharopoulos
12. Composition for the 21st Century by Frank Lisa
13. The Elements of Visual Style: The Basics of Print Design for Every Job by Robert W. Harris
14. Painting the Landscape in Watercolor: A Simplified Approach to Composition by Buck Paulson
15. Creative Composition Toolbox: Tips, Tricks, and Techniques for More Creative and Successful Photography by Michelle Perkins
16. Finding Your Visual Voice: A Painting Composition Book by Dakota Sexton
17. Composition for Metalwork by Tim McCreight
18. Painting with Composition in Mind: A Guide to Finding Your Own Visual Voice by Courtney Jordan
19. Artful Color, Mindful Composition: Color and Composition for Artists and Crafters by Judith Baker Montano
20. Composition for Beginners: Practical Skills to Learn in 30 Days or Less by Julia Diego

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts, (BFA) | | |
| Semester | Fourth | | |
| Name of the Course | **GRAPHIC DESIGN- I** | | |
| Course Code | **B23 – FAS- 404** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC –C4 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | NA | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1.Do composition, text generation, multiple effects and colour correction.<br>2. Develops strong conceptual frame work for different art techniques and ability to articulate the ideas embedded in their computer work.<br>3. Enhances the ability to manipulate different images with an innovative concept.<br>4. Inculcate proficiency with core visual skills for computer design that are easy to understand and use. | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>Practical – 18 Hours | |
| **Part B - Contents of the Course** | | | |
| **<u>Instructions for Paper- Setter</u>** | | | |

| Unit | Topics | Contact Hours |
|---|---|---|
| I | -Understanding the basics of graphics<br>- Exploring tools and features for creating visual designs<br>- Fundamental principles of design composition | 15 |
| II | -Study of design elements such as color, typography, and layout.<br>- Understanding how to use shapes, lines, and space effectively<br>- Creating visually appealing and balanced designs: symbol, Logo, monograms, Insignia, Emblems, and Logotype etc.<br>- Introduction to branding and visual identity | 15 |
| III | -Study and history of typography: Roman and Vernacular, Serif and San-Serif, Gothic & Roman, Italic etc.,<br>-letter as a design form; spacing; study of basic typefaces;<br>-Interrelation of Negative and Positive space; Design New Font | 15 |
| IV | - Exploring advanced features of graphic design software<br>- Learning advanced photo editing and manipulation techniques<br>- Creating complex visual effects and illustrations<br>- Experimenting with different design styles and trends<br><br>**No. of assignments: 10** | 15 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam / Submission: 15 | **End Term Examination: Practical - 70** |

**Part C - Learning Resources**

**Recommended Books/e-resources/LMS:**

1. "The Advertising Concept Book" by Pete Barry
2. "Graphic Design for Advertising" by Tony Seddon
3. "Layout Essentials: 100 Design Principles for Using Grids" by Beth Tondreau
4. "Advertising by Design: Generating and Designing Creative Ideas Across Media" by Robin Landa
5. "The Art of Advertising: Creative Ideas for World-Class Creativity" by John Caple
6. "Advertising Design and Typography" by Alex W. White
7. "The Advertising Design Handbook" by Warren Berger
8. "The Complete Guide to Advertising" by Saatchi & Saatchi
9. "Advertising Design and Communication" by Bonnie L. Drewniany
10. "Graphic Design as Communication" by Malcolm Barnard

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Fourth | | |
| Name of the Course | **COMPOSITION SCULPTURE - I** | | |
| Course Code | **B23 – FAS- 405** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – C4 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | 1. Imparting knowledge with Practical Assignments & manipulate, integrate, engineer materials to build three-dimensional art.<br>2. Enhancing the skill of research on form, materials and techniques as needed by the direction of their sculptural work<br>3. Develop ideas that are relevant and responsive to the world around.<br>4. Improves emotional intelligence by using earth material. | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:70** | | **Time:**<br>Practical – 18 Hours | |
| **Part B - Contents of the Course** | | | |
| **<u>Instructions for Paper- Setter</u>** | | | |

| Unit | Topics | Contact Hours |
|---|---|---|
| 1 | Introduction to Sculpture: Students will learn about the history and significance of sculpture as an art form, studying various styles and approaches. | 15 |

| | | |
|---|---|---|
| 2 | Anatomy and Proportions: Understanding the human form and anatomy is crucial for figurative sculpture. Students may study anatomy and proportions to accurately represent the human body in their sculptures. | 15 |
| 3 | Concept Development: The course will emphasize the development of conceptual thinking and idea generation. Students will learn how to translate their ideas into three-dimensional forms and create sculptures with meaningful narratives. | 15 |
| 4 | Design Principles: They will explore the fundamental principles of design, such as balance, proportion, rhythm, and unity, and how they apply to three-dimensional artwork | 15 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam / Submission: 15 | **End Term Examination: Practical- 70** |

**Part C - Learning Resources**

**Recommended Books/e-resources/LMS:**

The Art of Fiction" by John Gardner
The Elements of Style byWilliam Strunk Jr. and E.B. White
The Creative Writer's Handbook" by Philip K. Jason and Allan B. Lefcowitz

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Fourth | | |
| Name of the Course | **PRINT MAKING COMPOSITION- I** | | |
| Course Code | **B23 –FAS-406** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC- M4 (V) | | |
| Level of the course (As per Annexure-I | 100 - 199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Knowledge of using different Printmaking materials to prepare relief blocks.<br>2. Knowledge of different printing colour methods.<br>3. Introductory study of Intaglio Techniques with practical practices.<br>4. Inculcate the scientific approach in making edition of artworks | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>Practical- 18 Hours | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction of Materials and its use for making design for relief print.<br><br>Principles of stencil printing. Preparing drawing for stencils. Multi colour relief Printing process and preparing different blocks.<br><br>Working with glue, Texture white and lacquer for Collography block making and printing.<br><br>Introduction to Intaglio Printing and working Drypoint on Acrylic Sheet or metal sheet.<br><br>Handling and using of big Rollers for applying colours on intaglio plate . | 15 |
| II | Introduction to Printmaking<br>- Understanding the history and significance of printmaking as an art form<br>- Learning about the different printmaking techniques (relief, intaglio, lithography, screen printing)<br>- Exploring the materials and tools used in printmaking (block, plate, ink, brayer, press)<br>- Studying basic printmaking techniques and processes | 15 |
| III | Relief Printmaking Techniques<br>- Learning the process of relief printmaking (linocut, woodcut)<br>- Exploring the use of carving tools and techniques to create a relief block<br>- Experimenting with different mark-making techniques to achieve texture and detail<br>- Understanding the concept of editioning and creating multiple prints from a single block | 15 |
| IV | Intaglio Techniques<br>- Understanding intaglio printmaking techniques (Etching &Drypoint)<br>- Exploring the use of acids and other chemicals for etching<br>- Learning the process of creating prints using Acrylic Sheet or metal plates<br>- Studying different techniques for creating textures, shading, and tonal range in intaglio prints<br>**No. of assignments: 4**<br>**Size of Block- 12" X 12"** | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 0<br>• Seminar/presentation/assignment/quiz/class test etc.:0<br>• Mid-Term Exam: 0<br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam / Submission: 15 | | **End Term Examination: Practical- 70** |

| Part C - Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br>1. The Complete Printmaker by John Ross and Clare Romano<br>2. Printmaking: A Contemporary Art Form by Paul Coldwell<br>3. The Printmaking Bible: The Complete Guide to Materials and Techniques by Ann D'Arcy Hughes and Hebe Vernon-Morris<br>4. Mastering the Art of Printmaking by Wendy Stayman<br>5. Printmaking Handbook: Intaglio Techniques by Anne Desmet and Jim Anderson<br>6. Printmaking in the Sun by Dan Welden and Pauline Muir<br>7. Making Woodblock Prints by Merlyn Chesterman and Rod Nelson<br>8. The Art of Printmaking by Stan Smith<br>9. Japanese Prints: The Art of Masterpieces by MatthiForrer and Shinichi Segi<br>10. The Printmaker's Handbook: The Techniques of Lithography by Bill Ritchie<br>11. Printmaking at the Edge by Richard Noyce<br>12. The Book of Fine Prints: An Anthology of Printed Pictures and Introduction to the Study of Graphic Art in the West and the East by Francis J. Gribble<br>13. Screenprinting: The Complete Water-Based System by Robert Adam and Carol Robertson<br>14. Print Workshop: Hand-Printing Techniques and Truly Original Projects by Christine Schmidt<br>15. The Screenprinting Primer by Brad Faine<br>16. Printmaking Today by Rosemary Simmons<br>17. Lithography Manual by Abraham Pincus and Gene Landon<br>18. The Printmaker's Bible: Techniques, Tools, and Methods for Relief, Intaglio, Screenprinting, and Lithography by Ruth Leaf<br>19. Etching in America by David Acton and Susan LubowskyTalbott<br>20. Handprinted: A Fabric Lover's Guide to Creating Beautiful Blocks for Printing and More by Erin Dollar |

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts (BFA) | | |
| Semester | Fourth | | |
| Name of the Course | **PRESS LAYOUT& POSTER DESIGN** | | |
| Course Code | **B23 – FAS- 407** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC – M4 (V) | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | NA | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. To develop the skill to design News Paper Ad. According to technical and creative aspect of news paper.<br>2. Enhances the knowledge of analyze, synthesize and utilize design processes and strategy.<br>3. Imparting knowledge to deliver & solve communication problems creatively.<br>4. Utilize relevant application of tools and technology in the creation, reproduction, and distribution of visual decision. | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:**70 | | **Time:**<br>Practical – 18 Hours | |
| **Part B - Contents of the Course** | | | |
| **Instructions for Paper- Setter** | | | |

| Unit | Topics | Contact Hours |
|---|---|---|
| I | - Analyzing and understanding the purpose of press advertisements<br>- Designing effective press ad layouts<br>- Typography and copywriting principles for press ads<br>- Incorporating graphics, illustrations, and photographs<br>- Understanding the role and significance of press advertisements<br>- Exploring different types of print media and their audience<br>- Analyzing successful press advertisements from various industries Design Principles for Press Advertisement<br>- Studying the principles of graphic design applicable to print media<br>- Understanding the effective use of color, typography, and layout in press ads<br>- Learning to create visually appealing and attention-grabbing designs | 15 |
| II | -Copywriting and Message Development<br>-Understanding the importance of compelling copy in press advertisements<br>- Learning techniques for writing persuasive headlines, subheadings, and body copy<br>- Developing a clear message and call to action in press ads<br>-Production and Print Process<br>- Exploring the technical aspects of producing press advertisements<br>- Understanding different printing techniques and paper selection<br>- Preparing press ad files for print production | 15 |
| III | -Introduction to Poster Design<br>- Understanding the purpose and significance of poster advertisements<br>- Studying the history and evolution of poster design<br>- Analyzing the elements of effective poster design and their psychological impact on viewers<br>- Visual Communication and Composition<br>- Exploring principles of visual communication in poster design<br>- Understanding composition techniques, including balance, hierarchy, and focal points<br>- Utilizing color, typography, and imagery effectively in poster design | 15 |
| IV | -Concept Development and Message Delivery<br>- Developing strong concepts and ideas for poster advertisements<br>- Different influences on Poster designing.<br>- Identifying target audience and tailoring the message accordingly<br>- Stylistic choices and storytelling techniques for effective message delivery<br>- Production and Presentation<br>- Exploring the technical aspects of producing and presenting posters<br>- Understanding print production techniques and materials<br>- Preparing mock-ups, digital files, and presentations for client or exhibition purposes<br>**No. of assignments:**<br>Press Layouts: 02 in different sizes, Book cover Design: 01. Magazine Cover Design: 1. Poster- 2, Hording - 2 | 15 |

| Suggested Evaluation Methods |
|---|

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam / Submission: 15 | **End Term Examination Practical- 70** |

| **Part C - Learning Resources** |
|---|
| **Recommended Books/e-resources/LMS:**<br>1. "Advertising by Design: Generating and Designing Creative Ideas Across Media" by Robin Landa<br>2. "The Advertising Concept Book: Think Now, Design Later" by Pete Barry<br>3. "Hey, Whipple, Squeeze This: The Classic Guide to Creating Great Ads" by Luke Sullivan<br>4. "The Elements of Graphic Design: Space, Unity, Page Architecture, and Type" by Alex W. White<br>5. "Grid Systems in Graphic Design: A Visual Communication Manual for Graphic Designers, Typographers and Three Dimensional Designers" by Josef Müller-Brockmann<br>6. "Hey, Whipple, Squeeze This: The Classic Guide to Creating Great Ads" by Luke Sullivan<br>7. "Copywriting" by Mark Shaw<br>8. "The Idea Writers: Copywriting in a New Media and Marketing Era" by TeressaIezzi<br>9. "Production for Graphic Designers" by Alan Pipes<br>10. "Print Production Handbook" by David Bennett<br>11. "Making and Breaking the Grid: A Graphic Design Layout Workshop" by Timothy Samara<br>12. "The Complete Guide to Advertising" by Saatchi & Saatchi |

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Fourth | | |
| Name of the Course | **RELIEF MURAL COMPOSITION** | | |
| Course Code | **B23 – FAS- 408** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M4 (V) | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | 1. Knowledge to demonstrate visual literacy, including competency in the non-verbal languages of art.<br>2. Enhances to demonstrate competency in skill necessary for mural work including large scale work.<br>3. Competency and experience in the application process of creating work of mural projects.<br>4. Imparting knowledge of using natural and metal materials for execution of mural works | | |
| Credits | Theory | Practical | Total |
| | 0 | 4 | 4 |
| Contact Hours | 0 | 4 | 4 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks:70** | | **Time:**<br>Practical – 18 Hours | |

**Part B - Contents of the Course**

**<u>Instructions for Paper- Setter</u>**

| Unit | Topics | Contact Hours |
|---|---|---|
| 1 | To understand the history and significance of mural art in various cultures.<br>To explore different styles and approaches to mural working<br>To develop skills in mural planning, design, and execution.<br>To learn techniques for working on different surfaces and environments. | 15 |

| | | |
|---|---|---|
| 2 | Introduction to Mural Art<br><br>Overview of the history and cultural significance of murals.<br><br>Examination of famous mural artists and their works.Introduction to materials, tools, and safety guidelines | 15 |
| 3 | Concept Development<br><br>Exploring different approaches to conceptualizing mural ideas.Researching and gathering references for inspiration.Developing a theme or concept for the final mural project. | 15 |
| 4 | Designing the Mural<br><br>Understanding scale, proportion, and composition in mural design.Techniques for sketching and planning a mural layout.Incorporating the chosen concept into the design.<br><br>**<u>Courses of Study: Detail Practical Syllabus</u>**<br><br>Direct & Indirect Mural Techniques in Clay, Cement, Wood, Metal, Scrape, with proper understanding of the character of different material and tools employed to fix and finish. Use of common bodies of different types of used for Mural.<br><br>*Minimum Size: 12" x 12"C*<br>*Medium: Clay, Cement, Wood Carving/POP Carving/ Terracotta, Scrape Materials.*<br>*No. of Assignments : 03* | 15 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br><br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam / Submission: 15 | **End Term Examination: Practical - 70** |

**Part C - Learning Resources**

**Recommended Books/e-resources/LMS:**
Reliefs: Forms and Types" by Kathleen Nicastro and Robert H. Brill:
Reliefs and Inscriptions at Luxor Temple" by Peter J. Brand
The Techniques of Sculpture" by John W. Mills

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | First | | |
| Name of the Course | **BASIC SKETCHING & ILLUSTRATION** | | |
| Course Code | **B23-SEC- 107** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC-1 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | 1 Fundamental Skills: Students will develop proficient sketching and illustration techniques, mastering fundamental concepts such as line, shading, perspective, and proportion.<br>2 Creative Expression: Students will cultivate their unique artistic style, exploring different illustration styles, themes, and concepts.<br>3 Technical Proficiency: Through hands-on practice and guidance, students will gain expertise in using various illustration tools and software.<br>4 Conceptualization and Visualization: Learn to plan and visualize complex illustrations, honing their skills in brainstorming, conceptualizing, and executing creative projects effectively. | | |
| Credits | Theory | Practical | Total |
| | 0 | 3 | 3 |
| Contact Hours | 0 | 3 | 3 |
| **Max. Marks: 75**<br>**Internal Assessment Marks:25**<br>**End Term Exam Marks:**50 | | **Time:**<br>**Practical - 6 Hours** | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | 1: Foundations of Sketching and Basic Illustration Techniques<br>Introduction to Basic Sketching: Line, Shape, and Form<br>Understanding Perspective: One-Point, Two-Point, and Three-Point Perspective Drawing<br>Exploring Different Sketching Mediums: Pencil, Ink, Charcoal, and Pastels | 15 |
| II | 2: Basic Illustration Techniques and Styles<br>Environmental and Conceptual Illustration: Drawing Scenes, Backgrounds, and Imaginary Worlds<br>Exploring Various Illustration Styles: Realism, Cartoons, Abstract, and Mixed Media | 15 |
| III | 3; Picture Book Illustration: Creating Illustrations for Children books, Newspapers, and Online Articles<br>**No. of assignments: Sketching 500, Illustration-8** | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 25**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 07<br>• Mid-Term Exam / Submission: 13 | | **End Term Examination: 50** |
| **Part C - Learning Resources** | | |

**Recommended Books/e-resources/LMS:**

1 "Drawing on the Right Side of the Brain" by Betty Edwards
2 "Keys to Drawing" by Bert Dodson
3 "The Natural Way to Draw: A Working Plan for Art Study" by Kimon Nicolaïdes
4 "Perspective Made Easy" by Ernest R. Norling
5 "How to See: Visual Adventures in a World God Never Made" by George Nelson
6 "The Complete Guide to Drawing and Illustration: A Practical and Inspirational Course for Artists of All Abilities" by Peter Gray
7 "Color and Light: A Guide for the Realist Painter" by James Gurney
8 "Creative Illustration" by Andrew Loomis
9 "Figure Drawing: Design and Invention" by Michael Hampton
10 "Botany for the Artist: An Inspirational Guide to Drawing Plants" by Sarah Simblet

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Second | | |
| Name of the Course | **ADVANCE SKETCHING & ILLUSTRATION** | | |
| Course Code | **B23-SEC- 227** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC-2 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | 1 Fundamental Skills: Students will develop proficient sketching and illustration techniques, mastering fundamental concepts such as line, shading, perspective, and proportion.<br>2 Creative Expression: Students will cultivate their unique artistic style, exploring different illustration styles, themes, and concepts.<br>3 Technical Proficiency: Through hands-on practice and guidance, students will gain expertise in using various illustration tools and software.<br>4 Conceptualization and Visualization: Learn to plan and visualize complex illustrations, honing their skills in brainstorming, conceptualizing, and executing creative projects effectively. | | |
| Credits | Theory | Practical | Total |
| | 0 | 3 | 3 |
| Contact Hours | 0 | 3 | 3 |
| **Max. Marks: 75**<br>**Internal Assessment Marks:25**<br>**End Term Exam Marks:**50 | | **Time:**<br>**Practical - 6 Hours** | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | 1: Advance Sketching and Illustration Techniques<br>Introduction to Shading and Light: Techniques for Creating Depth and Volume in Sketches<br>Exploring Different Sketching Mediums: Pencil, Ink, Charcoal, and Pastels | 15 |
| II | 2: Advanced Illustration Techniques and Styles<br>Environmental and Conceptual Illustration: Drawing Scenes, Backgrounds, and Imaginary Worlds<br>Exploring Various Illustration Styles: Realism, Cartoons, Abstract, and Mixed Media | 15 |
| III | 3: Professional Applications and Portfolio Development<br>Editorial Illustration: Creating Illustrations for Magazines, Newspapers, and Online Articles<br>Storyboarding and Sequential Art: Illustrating Narratives and Comics<br>Painting Techniques: Adding Texture, Color Gradients, and Special Effects<br>Building a Portfolio: Organizing and Presenting Artwork, Self-Promotion, and Professional Practices in the Illustration Industry<br>**No. of assignments: Sketching 500, Illustration-8** | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 25**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 07<br>• Mid-Term Exam / Submission: 13 | | **End Term Examination: 50** |
| **Part C - Learning Resources** | | |

**Recommended Books/e-resources/LMS:**

1 "Drawing on the Right Side of the Brain" by Betty Edwards
2 "Keys to Drawing" by Bert Dodson
3 "The Natural Way to Draw: A Working Plan for Art Study" by Kimon Nicolaïdes
4 "Perspective Made Easy" by Ernest R. Norling
5 "How to See: Visual Adventures in a World God Never Made" by George Nelson
6 "The Complete Guide to Drawing and Illustration: A Practical and Inspirational Course for Artists of All Abilities" by Peter Gray
7 "Color and Light: A Guide for the Realist Painter" by James Gurney
8 "Creative Illustration" by Andrew Loomis
9 "Figure Drawing: Design and Invention" by Michael Hampton
10 "Botany for the Artist: An Inspirational Guide to Drawing Plants" by Sarah Simblet

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Third | | |
| Name of the Course | **INTAGLIO PRINTING** | | |
| Course Code | **B23-SEC- 327** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC-3 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | 1 Technical Proficiency: Demonstrating proficiency in handling tools, materials, and processes involved in creating intricate and visually compelling prints.<br>2 Creative Expression: Cultivate their creativity, experimenting with textures, tones, and mixed media elements.<br>3 Critical Thinking and Problem-Solving: Students will enhance their critical thinking skills by analyzing the visual impact of their prints, making informed decisions about technique selection, and solving technical challenges.<br>4 Professionalism and Presentation: Students will acquire essential knowledge about professional practices in the art world, including framing, exhibition preparation, and portfolio development. | | |
| Credits | Theory | Practical | Total |
| | 0 | 3 | 3 |
| Contact Hours | 0 | 3 | 3 |
| **Max. Marks: 75**<br>**Internal Assessment Marks: 25**<br>**End Term Exam Marks:**50 | | **Time:**<br>**Practical - 12 Hours** | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Intaglio Printmaking<br>Overview of Printmaking Techniques<br>Historical Background of Intaglio Printmaking<br>Introduction to Tools and Materials<br>Safety Procedures and Studio Etiquette | 15 |
| II | Drypoint Etching: Basic Techniques and Applications<br>Engraving: Line Quality and Mark-making<br>Mezzotint: Creating Tonal Variations<br>Aquatint: Introducing Tonal Range and Texture<br>Advanced Intaglio Methods<br>Soft Ground Etching: Exploring Texture and Detail<br>Multi-Plate Printing: Registration and Color Blending | 15 |
| III | Photo Intaglio: Integrating Photography into Prints<br>Experimental Approaches and Contemporary Trends<br>Collagraphy: Creating Collage-based Plates<br>Mixed Media in Intaglio: Incorporating Other Art Forms<br>Professional Practices and Exhibition Techniques in Intaglio Printmaking<br>**No. of assignments: 4** | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 25**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 07<br>• Mid-Term Exam / Submission: 13 | | **End Term Examination: 50** |
| **Part C - Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>1 "Intaglio Printmaking" by Myra Toth<br>2 "Printmaking: A Complete Guide to Materials & Processes" by Bill Fick and Beth Grabowski<br>3 "Intaglio: Acrylic-Resist Etching, Collagraphy, Engraving, Drypoint, Mezzotint" by Robert Adam and Carol Robertson<br>4 "Intaglio Simultaneous Color Printmaking: Significance of Materials and Processes" by Wuon-Gean Ho<br>5 "Printmaking Revolution: New Advancements in Technology, Safety, and Sustainability" by Dwight Pogue<br>6 "Intaglio Printmaking with Photopolymer Plates: A Manual for Artists & Printmakers" by Robert Adam and Carol Robertson | | |

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts, (BFA) | | |
| Semester | Third | | |
| Name of the Course | **GRAPHIC DESIGN** | | |
| Course Code | **B23 – SEC- 328** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC-3 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | NA | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1.Do composition, text generation, multiple effects and colour correction.<br>2. Develops strong conceptual frame work for different art techniques and ability to articulate the ideas embedded in their work.<br>3. Enhances the ability to manipulate different images with an innovative concept.<br>4. Inculcate proficiency with core visual skills for design that are easy to understand and use. | | |
| Credits | Theory | Practical | Total |
| | 0 | 3 | 3 |
| Contact Hours | 0 | 3 | 3 |
| **Max. Marks: 75**<br>**Internal Assessment Marks: 25**<br>**End Term Exam Marks:**50 | | **Time:**<br>Practical – 12 Hours | |

| Part B - Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | -Understanding the basics of graphics<br>- Exploring tools and features for creating visual designs<br>- Fundamental principles of design composition | 15 |
| II | -Study of design elements such as color, typography, and layout.<br>- Understanding how to use shapes, lines, and space effectively<br>- Creating visually appealing and balanced designs: symbol, Logo, monograms, Insignia, Emblems, and Logotype etc.<br>- Introduction to branding and visual identity | 15 |
| III | -Study and history of typography: Roman and Vernacular, Serif and San-Serif, Gothic & Roman, Italic etc.,<br>-letter as a design form; spacing; study of basic typefaces;<br>-Interrelation of Negative and Positive space; Design New Font<br>**No. of assignments: 4** | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum - 25**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 07<br>• Mid-Term Exam / Submission: 13 | **End Term Examination: Practical - 50** |

**Part C - Learning Resources**

**Recommended Books/e-resources/LMS:**

1. "The Advertising Concept Book" by Pete Barry
2. "Graphic Design for Advertising" by Tony Seddon
3. "Layout Essentials: 100 Design Principles for Using Grids" by Beth Tondreau
4. "Advertising by Design: Generating and Designing Creative Ideas Across Media" by Robin Landa
5. "The Art of Advertising: Creative Ideas for World-Class Creativity" by John Caple
6. "Advertising Design and Typography" by Alex W. White
7. "The Advertising Design Handbook" by Warren Berger
8. "The Complete Guide to Advertising" by Saatchi & Saatchi
9. "Advertising Design and Communication" by Bonnie L. Drewniany
10. "Graphic Design as Communication" by Malcolm Barnard

*Applicable for courses having practical component.

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fine Arts | | |
| Semester | Third | | |
| Name of the Course | **CLAY MODELING** | | |
| Course Code | **B23 – SEC- 329** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC-3 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | 1. Imparting knowledge with Practical Assignments & manipulate, integrate, engineer materials to build three dimensional art.<br>2. Enhancing the skill of research on form, materials and techniques as needed by the direction of their sculptural work<br>3. Develop ideas that are relevant and responsive to the world around.<br>4. Improves emotional intelligence by using earth material. | | |
| Credits | Theory | Practical | Total |
| | 0 | 3 | 3 |
| Contact Hours | 0 | 3 | 3 |
| **Max. Marks: 75**<br>**Internal Assessment Marks: 25**<br>**End Term Exam Marks:50** | | **Time:**<br>Practical – 12 Hours | |
| **Part B - Contents of the Course** | | | |
| **<u>Instructions for Paper- Setter</u>** | | | |

| Unit | Topics | Contact Hours |
|---|---|---|
| 1 | Introduction to Clay Modeling Basics<br>1.1 Understanding Clay as a Medium<br>Types of clay used in modeling (e.g., earthenware, stoneware, polymer clay).<br>Properties of clay: texture, plasticity, drying, and firing processes. | 15 |

| | | |
|---|---|---|
| | 1.2 Essential Tools and Materials<br><br>Overview of basic tools: sculpting tools, rolling pins, wire tools, and carving tools.<br>Introduction to armatures and their role in clay modeling.<br>Safety precautions and proper handling of tools and materials.<br>1.3 Basic Clay Modeling Techniques<br>Hand-building techniques: pinch, coil, and slab methods.<br>Basics of wheel throwing (pottery wheel) for advanced learners.<br>Creating basic forms: spheres, cylinders, and cubes to understand volume and proportion. | |
| 2 | 2: Advanced Clay Modeling Techniques<br>2.1 Sculpting Human and Animal Figures<br>Anatomy basics: proportions, skeletal structure, and muscle definition.<br>Step-by-step guide to sculpting a human face and body.<br>Animal anatomy and creating realistic animal sculptures.<br>2.2 Detailing and Texture Techniques<br>Adding fine details: facial features, hair, fur, and clothing.<br>Texture techniques: stamping, carving, and adding intricate patterns.<br>Experimentation with various textures to create depth and visual interest.<br>2.3 Glazing and Finishing Touches<br>Introduction to glazes: types, application methods, and firing temperatures.<br>Techniques for achieving different finishes: matte, glossy, and textured surfaces.<br>Tips for proper kiln firing and understanding temperature control. | 15 |
| 3 | 3: Advanced Concepts and Specializations in Clay Modeling<br>3.1 Sculpture Composition and Expression<br>Composition principles: balance, harmony, rhythm, and focal points in sculptures.<br>3.2 Specialized Clay Modeling Techniques<br>Sculpting busts and caricatures.<br>Creating abstract and contemporary sculptures.<br><br>**No. of assignments: 4** | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br><br>➢ **Practicum - 30**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 07<br>• Mid-Term Exam / Submission: 13 | | **End Term Examination: Practical- 50** |

| Part C - Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br>The Art of Fiction" by John Gardner<br>The Elements of Style byWilliam Strunk Jr. and E.B. White<br>The Creative Writer's Handbook" by Philip K. Jason and Allan B. Lefcowitz |

*Applicable for courses having practical component.

**DEPARTMENT OF LAW**
**KURUKSHETRA UNIVERSITY KURUKSHETRA**

# SCHEME AND SYLLABUS REVISED IN 2022-23

**FOR**

**Choice Based Credit System (CBCS)**
**(w. e. f. Academic Session 2016-17)**
**LL.M. 2-Year Degree Course**

**Under**

**This syllabus is only implemented in University Teaching Department**

# DEPARTMENT OF LAW

## Scheme and syllabus for LL.M. 2-Year Degree Course under Choice Based Credit System w.e.f. Academic Session 2016-17

**Credit Matrix for LL.M. 2-Year Programme w.e.f. 2016-17**

| SEMESTER | CORE PAPER | ELECTIVE PAPER | OPEN ELECTIVE PAPER(INTERDISCIPLINARY) | MAX. MARKS | TOTAL CREDITS |
|---|---|---|---|---|---|
| I | 4(100 marks each) | NIL | NIL | 400 | 20 |
| II | 2(100 marks each) | 2(100 marks each) | 1(50 marks each) | 450 | 22 |
| III | 2(100 marks each) | 2(100 marks each) | 1(50 marks each) | 450 | 22 |
| IV | 1-Dissertation (200Marks) | 2(100 marks each) | NIL | 400 | 20 |
| TOTAL | 9 | 6 | 2 | 1700 | 84 |

**TOTAL CREDITS FOR LL.M. TWO YEAR DEGREE COURSE= 84 (1 credit= 20 marks)**
**Total Core Papers in LL.M. 2-Year Degree Course = 09(8+1(Dissertation))**
**Total Elective Papers in LL.M. 2-Year Degree Course = 06**
**Total Open Elective Papers in LL.M. 2-Year Degree Course = 02** (As per the list of the open elective papers supplied by the faculty of social science)

**SEMESTER-WISE SCHEME OF LL.M. 2-Year Degree Course**

LL.M. course shall consist of four semesters of 2 years duration. Semester-I and II for first year and semester-III and IV for second year. In semester-I there shall be four core papers of 5 credits each. In Semester-II there shall be two core papers of 5 credits each and two elective papers of 5 credits each. The student is required to opt any one group out of the groups mentioned in the syllabus for the purpose of Elective Papers. The group opted by the student in Semester-II shall not be changed at any subsequent stage. There shall also be one open elective paper of maximum 40 marks and having 2 credits. This paper shall be opted out of the list of open elective papers supplied by the faculty of social science. In Semester-III there shall be two core papers of 5 credits each and two elective papers of 5 credits each of the group already opted by the student in Semester-II. There shall also be one open elective

paper of 2 credits and of maximum 40 marks. This paper shall be opted out of the list of open elective papers supplied by the faculty of social science. In Semester-IV there shall be one core paper of Dissertation of maximum 200 marks and of 10 credits and two elective papers of 5 credits each of the group already opted by the student in Semester-II.

The entire syllabus has been divided into four units but the question paper shall be divided into five units. The student is required to attempt five questions in all. Unit-I shall contain one compulsory question having four parts. Each part shall carry five marks. This question shall be fairly spread over the entire syllabus. The student is required to attempt four more questions by selecting one question from each unit i.e. Unit-II to Unit-V having two questions in each unit. Each question shall carry twenty marks.

**The medium of instructions and examination shall be English.**

Note: **Only those groups shall be opened by the Department in which there is arrangement for teaching in Department of Law.**

**LL.M. FIRST SEMESTER**

| **LL.M. 1ST SEMESTER** | | | | |
|---|---|---|---|---|
| **PAPER CODE** | **NOMENCLATURE OF PAPER** | **Hours per Week** | **MAX. MARKS** | **CREDITS** |
| 101-Paper-I (Core Paper) | Legal Theory | 5 | 100 | 5 |
| 102-Paper-II (Core Paper) | Indian Constitutional Law and the New Challenges | 5 | 100 | 5 |
| 103-Paper-III (Core Paper) | Principles of Statutory Interpretation | 5 | 100 | 5 |
| 104- Paper- IV (Core Paper) | Legal and Constitutional History | 5 | 100 | 5 |

**Total Credits=20**

**LL.M. 2nd SEMESTER**

| **LL.M. 2nd SEMESTER** | | | | |
|---|---|---|---|---|
| **PAPER CODE** | **NOMENCLATURE OF PAPER** | **Hours per Week** | **MAX. MARKS** | **CREDITS** |
| 201- Paper- I (Core Paper) | Law, Social Transformation and Judicial Process in India | 5 | 100 | 5 |
| 202- Paper- II (Core | Comparative Law | 5 | 100 | 5 |

| | | | | |
|---|---|---|---|---|
| Paper) | | | | |
| ELECTIVE PAPERS<br>203-Paper-1<br>204-Paper- II | **(The candidate is required to opt any one group out of the following groups)** | | | |
| | **GROUP –A: INTERNATIONAL LAW & ORGANIZATIONS** | | | |
| | 203-Paper-1 : International organization : Law , Practice and Future | 5 | 100 | 5 |
| | 204-Paper- II: Disarmament and peace strategies | 5 | 100 | 5 |
| | **Group- B: CRIMINAL LAW** | | | |
| | 203-Paper –I: History and principles of criminal Law | 5 | 100 | 5 |
| | 204-Paper –II: Comparative Criminal Procedure | 5 | 100 | 5 |
| | **GROUP- C: BUSINESS LAW** | | | |
| | 203- Paper- I: Corporate Law and Management | 5 | 100 | 5 |
| | 204- Paper- II: Law of Contractual Transactions | 5 | 100 | 5 |
| | **GROUP-D: LABOUR, CAPITAL AND LAW** | | | |
| | 203-Paper –I: Law relating to Labour Management Relations | 5 | 100 | 5 |
| | 204-Paper -II: Industrial Adjudication | 5 | 100 | 5 |
| | **GROUP-E: ENVIRONMENT AND LEGAL ORDER** | | | |
| | 203-Paper-I: Environment and Development: Law and Policy | 5 | 100 | 5 |
| | 204-Paper-II: Resource Management and the law | 5 | 100 | 5 |
| | **GROUP-F: JURISPRUDENCE** | | | |
| | 203-Paper-I: Comparative Judicial Process | 5 | 100 | 5 |
| | 204-Paper-II: Marxian and Theory of Law | 5 | 100 | 5 |
| | **GROUP-G: CONSTITUTION & LEGAL ORDER** | | | |
| | 203- Paper- I : Mass Media and Democracy Constitutional | 5 | 100 | 5 |
| | 204- Paper- II : Public Utilities and Welfare State | 5 | 100 | 5 |
| | **GROUP-H: FEMINIST CRITIQUE OF LEGAL ORDER** | | | |
| | 203-Paper-1: Feminist Theorizing and Legal Order | 5 | 100 | 5 |

| | | | | |
|---|---|---|---|---|
| | 204-Paper-II: Nationalist Struggle and Gender Equality | 5 | 100 | 5 |
| | **GROUP: I SCIENCE , TECHNOLOGY AND LAW** | | | |
| | 203-Paper-1: Law , Science and Technology | 5 | 100 | 5 |
| | 204-Paper-II: Law, Science and Medicine | 5 | 100 | 5 |
| | **GROUP- J: HUMAN RIGHT LAW** | | | |
| | 203-Paper-I: Concept and Development of Human Rights. | 5 | 100 | 5 |
| | 204-Paper-II: Human Rights and International Order | 5 | 100 | 5 |
| | **GROUP K: ADMINISTRATIVE LAW** | | | |
| | 203-Paper-I: Administrative Process: Nature and Scope | 5 | 100 | 5 |
| | 204-Paper-II: Administrative Process and Judicial Control | 5 | 100 | 5 |
| 205- Paper-V(Open Elective Paper) | One paper shall be opted out of the list of open elective papers supplied by the Faculty of Social Science | 2 | 50 | 2 |

**Total Credits=22**

**LL.M. 3rd SEMESTER**

| **LL.M. 3rd SEMESTER** | | | | |
|---|---|---|---|---|
| **PAPER CODE** | **NOMENCLATURE OF PAPER** | **Hours per Week** | **MAX. MARKS** | **CREDITS** |
| 301- Paper- I (Core Paper) | Research Methodology | 5 | 100 | 5 |
| 302- Paper-I (Core Paper) | Law of Equity and Trust | 5 | 100 | 5 |
| ELECTIVE PAPERS<br><br>303-Paper-1<br>304-Paper- II | **(The candidate is required to opt any one group out of the following groups)**<br>**GROUP –A :INTERNATIONAL LAW & ORGANISATIONS** | | | |
| | 303-Paper –III: International Humanitarian Law. | 5 | 100 | 5 |
| | 304-Paper –IV: Law and Diplomacy | 5 | 100 | 5 |
| | **Group- B: CRIMINAL LAW** | | | |

| | | | | |
|---|---|---|---|---|
| | 303-Paper –III : Criminology | 5 | 100 | 5 |
| | 304-Paper –IV : Penology | 5 | 100 | 5 |
| | **GROUP-C: BUSINESS LAW** | | | |
| | 303- Paper- III: Law of Banking and Negotiable Instruments | 5 | 100 | 5 |
| | 304- Paper- IV: Law of Industrial and Intellectual Property | 5 | 100 | 5 |
| | **GROUP-D: LABOUR, CAPITAL AND LAW** | | | |
| | 303-Paper –III: Law Relating to Social Security | 5 | 100 | 5 |
| | 304-Paper –IV: Law Relating to Wages & Monetary Benefits | 5 | 100 | 5 |
| | **GROUP-E: ENVIRONMENT AND LEGAL ORDER** | | | |
| | 303-Paper-III: Prevention and Control of Pollution | 5 | 100 | 5 |
| | 304-Paper-IV: Environment and international Legal Order | 5 | 100 | 5 |
| | **GROUP-F: JURISPRUDENCE** | | | |
| | 303-Paper-III: Socialist Jurisprudence | 5 | 100 | 5 |
| | 304-Paper-IV: Theories of Justice | 5 | 100 | 5 |
| | **GROUP-G: CONSTITUTION & LEGAL ORDER** | | | |
| | 303- Paper- III: Constitutionalism: Power of Judicial Review | 5 | 100 | 5 |
| | 304- Paper- IV: Federalism: Union-State Relations | 5 | 100 | 5 |
| | **GROUP-H: FEMINIST CRITIQUE OF LEGAL ORDER** | | | |
| | 303-Paper-III: Patriarchal Elements in Indian Law | 5 | 100 | 5 |
| | 304-Paper-IV: Gender Perspective in International Law | 5 | 100 | 5 |
| | **GROUP: I SCIENCE , TECHNOLOGY AND LAW** | | | |
| | 303-Paper-III: The Electronics Revolution and Legal Order | 5 | 100 | 5 |
| | 304-Paper-IV: Nuclear Technology: Dilemmas of Legal Controls | 5 | 100 | 5 |
| | **GROUP- J: HUMAN RIGHT LAW** | | | |
| | 303-Paper-III: Protection and Enforcement of Human Rights | 5 | 100 | 5 |
| | 304-Paper-IV Human Rights of Disadvantaged Groups: Problems and issues | 5 | 100 | 5 |

| | | | | |
|---|---|---|---|---|
| | in the Protection and Enforcement | | | |
| | **GROUP K: ADMINISTRATIVE LAW** | | | |
| | 303-Paper-III: Administrative Process-Delegated Legislation and Adjudication | 5 | 100 | 5 |
| | 304-Paper-IV: Administrative Process: Controls of Discretion and Maladministration. | 5 | 100 | 5 |
| 305- Paper-V(Open Elective Paper) | One paper shall be opted out of the list of open elective papers supplied by the Faculty of Social Science | 2 | 50 | 2 |

**Total Credits=22**

**LL.M. 4th SEMESTER**

| **LL.M. 4th SEMESTER** | | | | |
|---|---|---|---|---|
| **PAPER CODE** | **NOMENCLATURE OF PAPER** | **Hours per Week** | **MAX. MARKS** | **CREDITS** |
| 401- Paper-I (Core Paper) | Dissertation | -- | 200 | 10 |
| ELECTIVE PAPERS | **(The candidate is required to opt any one group out of the following groups)** | | | |
| 402-Paper-II<br>403-Paper- III | **GROUP –A : INTERNATIONAL LAW & ORGANIZATIONS** | | | |
| | 402-Paper –V : Law of the Sea. | 5 | 100 | 5 |
| | 403-Paper–VI : International and contemporary issues | 5 | 100 | 5 |
| | **Group- B: CRIMINAL LAW** | | | |
| | 402-Paper –V : Drug Addiction, Criminal Justice and Human Rights | 5 | 100 | 5 |
| | 403-Paper –VI : Juvenile Delinquency | 5 | 100 | 5 |
| | **GROUP-C: BUSINESS LAW** | | | |
| | 402- Paper- V : Insurance Law | 5 | 100 | 5 |
| | 403- Paper- VI : Legal Regulation of Economic Enterprises | 5 | 100 | 5 |
| | **GROUP-D: LABOUR, CAPITAL AND LAW** | | | |
| | 402-Paper –V: Law Relating to Unorganised Labour | 5 | 100 | 5 |
| | 403-Paper –VI: Law Relating to Civil Servants | 5 | 100 | 5 |
| | **GROUP-E: ENVIRONMENT AND LEGAL ORDER** | | | |

| | | | | |
|---|---|---|---|---|
| | 402-Paper-V: Biological Diversity and Legal order | 5 | 100 | 5 |
| | 403-Paper-VI: Environmental Legislation | 5 | 100 | 5 |
| | **GROUP-F: JURISPRUDENCE** | | | |
| | 402-Paper-V: Law and Society | 5 | 100 | 5 |
| | 403-Paper – VI: Concepts of Rights | 5 | 100 | 5 |
| | **GROUP-G: CONSTITUTION & LEGAL ORDER** | | | |
| | 402- Paper- V: Human Rights: Constitution of India | 5 | 100 | 5 |
| | 403- Paper- VI: Constitutional Pluralism: Protection of Special National Interests | 5 | 100 | 5 |
| | **GROUP-H: FEMINIST CRITIQUE OF LEGAL ORDER** | | | |
| | 402-Paper-V:Labour, Gender and Law | 5 | 100 | 5 |
| | 403-Paper-VI: Population Planning and the Role of Women | 5 | 100 | 5 |
| | **GROUP: I SCIENCE , TECHNOLOGY AND LAW** | | | |
| | 402-Paper-V: Biotechnology and Legal Regulation | 5 | 100 | 5 |
| | 403-Paper-VI: Epidemiological and Public Health aspects of Science and Technology | 5 | 100 | 5 |
| | **GROUP- J: HUMAN RIGHTS LAW** | | | |
| | 402-Paper-V: International Humanitarian Law and Refugee Law | 5 | 100 | 5 |
| | 403-Paper-VI: Science, Technology and Human Rights | 5 | 100 | 5 |
| | **GROUP K: ADMINISTRATIVE LAW** | | | |
| | 402-Paper-V: Public Authorities: Liability | 5 | | |
| | 403-Paper-VI: Comparative Administrative Law | 5 | 100 | 5 |

**Total Credits=20**

Annexure to Item 10(22)

Revised Syllabus

Annexure-A

Kurukshetra University Kurukshetra
Scheme of Examination for UG Programme (Interdisciplinary): Scheme D
Course: Bachelor of Shastri
under multiple entry exit internship and CBCS-LOCF
As per NEP 2020, to be implemented w.e.f the Session 2023-24
(in the Phased Manner)

| Session: 2023-24 | |
|---|---|
| **Part A – Introduction** | |
| Subject | Sanskrit |
| Semester | I |
| Name of the Course | Bachelor of Shastri |
| Course Code | B023-SHT-101 व्याकरणम् अनुवादश्च |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-A1 |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | Senior Secondary (10+2) or visharad or Equivalent in any stream |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>CLO : 101.1 – अस्मिन् घटके संज्ञाप्रकरणमाध्यमेन प्रयुक्तानां संज्ञानां ज्ञानं छात्रेभ्य: प्रदीयते।<br>CLO : 102.2 – अस्मिन् घटके छात्रा: सन्धिविषये अवगता: भविष्यन्ति। येन ते सन्धिस्थ-पदानां ज्ञाने समर्था: भविष्यन्ति।<br>CLO : 101.3 – संस्कृतभाषाज्ञानाय कारकप्रकरणस्य ज्ञानमावश्यकं |

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|---|---|
| | वर्तते। तत् अनेन घटकेन प्रदास्यते।<br>CLO : 101.4 – घटकेऽस्मिन् दैनन्दिनव्यवहारे प्रयुक्तानां वाक्यानां ज्ञानं छात्रेभ्यः प्रदास्यते। |

| Credits | Theory | Practical | Total |
|---|---|---|---|
| | 3+1 | -- | 4 |
| Contact Hours | 60 | -- | 60 |

| | | |
|---|---|---|
| **Max. Marks:**<br>**Internal Assessment Marks:**<br>**End Term Exam Marks:** | **100**<br>**30**<br>**70** | **Time: 3 Hrs.** |

**Part B- Contents of the Course**

Instructions for Paper-Setter

1. प्रश्नपत्रे पञ्चप्रश्नाः भविष्यन्ति। प्रश्नपत्राय 70 अङ्काः निर्धारिताः सन्ति। प्रत्येकं प्रश्नः चतुर्दशाङ्कानां भविष्यति।
2. प्रथमः प्रश्नः अनिवार्यः वर्तते। प्रश्नोऽयं पाठ्यक्रमस्य चतुर्घटकेषु आधारितः भविष्यति। अस्मिन् लघूत्तरीयाः 7 प्रश्नाः विकल्परहिताः प्रदास्यन्ते। प्रत्येकं प्रश्नः अङ्कद्वयोः भविष्यति।
3. द्वितीयतृतीयचतुर्थपञ्चम-प्रश्नानां निर्माणं यथाक्रमं चतुर्घटकेषु आधारितः भविष्यति। प्रत्येकस्मात् घटकात् द्वौ वैकल्पिकप्रश्नौ प्रदास्येते। ये प्रश्न वैकल्पिक होंगे ।

| Unit | Topics | | Contact Hours |
|---|---|---|---|
| I | संज्ञाप्रकरणम्। (लघुसिद्धान्तकौमुदी) | 14 अंकाः | **14** |
| | (क) प्रत्याहारसूत्राणि, उच्चारणस्थानानि | 2x4=8 अंकाः | |
| | (ख) सूत्र-व्याख्या | 2x3=6 अंकाः | |

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| | | |
|---|---|---|
| II | सन्धि-प्रकरणम् (अच् एवं हल्) (लघुसिद्धान्तकौमुदी) 14 अंकाः<br>(क) सूत्रव्याख्या 2x3=6 अंकाः<br>(ख) सूत्रोल्लेखपूर्वकं **सन्धि-प्रतिपादनम्** 2x4=8 अंकाः | 18 |
| III | कारक-प्रकरणम् (वैयाकरणसिद्धान्तकौमुदी) 14 अंकाः<br>(क) सूत्र व्याख्या 2x3=6 अंकाः<br>(ख) सूत्रोल्लेखपूर्वकं कारकविभक्ति-प्रतिपादनम् 2x4=8 अंकाः | 18 |
| IV | संस्कृतवाग्व्यवहारः । 14 अंकाः<br>(क) परिचयः, शिष्टाचारः, भोजनम्, समयः, परीक्षा, वातावरणम्, अतिथिः, शुभाशया । 8 अकाः<br>(ख) अपठितगद्यांशस्य संस्कृतानुवादः। 6 अंकाः | 14 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment: 30 Marks**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5+5=10<br>• Mid-Term Exam: 15 | **End Term Examination:**<br><br>**70 Marks** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. लघुसिद्धान्तकौमुदी वरदराजाचार्यकृत, चौखम्भा सुरभारती प्रकाशन, वाराणसी
2. वैयाकरणसिद्धान्तकौमुदी श्रीमद्भट्टोजिदिक्षितविरचिता (कारक-प्रकरणम्) साहित्य भण्डार, सुभाष बाजार, मेरठ
3. संस्कृत व्यवहार-साहस्री, संस्कृत भारती, दिल्ली

K. Devi

Chairperson
Dept. of Sanskrit, [illegible]

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Revised Syllabus

Annexure-B

**Kurukshetra University Kurukshetra**
**Scheme of Courses in Sanskrit for U.G Programme Subject Sanskrit**
**as per NEP 2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)**
**to be implemented w.e.f the Session 2023-24**
**(in the Phased Manner)**

| Session: 2023-24 | |
|---|---|
| **Part A - Introduction** | |
| Subject | Sanskrit |
| Semester | 2nd |
| Name of the Course | Bachelor of Arts |
| Course Code | B23-SKT-201, श्रीमद्भगवद्गीता, स्वस्थवृत्तं छन्दशास्त्रं च |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-2/<br>MCC-3 |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | ---------- |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>CLO-201-1 गीता भारतीय संस्कृति तथा ज्ञान का उत्कर्ष है। गीता को कर्म तथा ज्ञान के सम्यक् बोध के रूप में जाना जाता है । गीता के द्वितीय अध्याय को 'सांख्य-योग' के नाम से जाना जाता है। इस अध्याय में जीवन के मर्म को जानकर कर्म करने की प्रेरणा दी गई है। यह सभी मनुष्यों को जानना चाहिए ।<br><br>CLO-201-2 द्वितीय घटक में नीतिशतक के 51-100 श्लोकों को शामिल किया गया है । न्याय एवं नीति बोध जीवन को सरल बना देता है। भर्तृहरि ने मनुष्यों को शिक्षा देने का प्रयास किया है कि हमारा सामाजिक व्यवहार कैसे हो । यह सभी छात्रों को जानना चाहिए । |

| | | | |
|---|---|---|---|
| | CLO-201-3 संस्कृत धातु रूपों के ज्ञान के अभाव में भाषा को नही समझा जा सकता । धातु प्रत्ययों का बोध इस घटक में दिया गया है। संस्कृत में धातुओं की संख्या दो हजार के आसपास है। अतः इनका बोध भाषा को सरल रूप में समझने में सहायक है।<br>CLO-201-4 संस्कृत भाषा में साहित्य को लिखने की तीन विधियां है, पद्य, गद्य तथा दोनों का मिला हुआ स्वरूप । पद्यों में रचना के लिए छन्दों का ज्ञान आवश्यक है । कविता छंद के बिना नहीं हो सकती। अतः छात्रों को आरम्भि छंदो का ज्ञान इस घटक में दिया जाता है । छात्रों की रुचि कविता में हो ऐसा छंदों के ज्ञान से संभव है । | | |
| Credits 4 | Theory + Tutorial | Practical | Total |
| | 3+1 | ---------- | 4 |
| Contact Hours | 60 | ---------- | 60 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 30**<br>**End Term Exam Marks: 70** | | **Time: 3 Hrs.** | |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

*प्रश्नपत्र-निर्माणकेलियेनिर्देशः-*

1. प्रश्नपत्र में कुल पाँच (5) प्रश्न दिये जाएँ। प्रश्नपत्र के लिये कुल 70 अङ्क निर्धारित हैं। सभी प्रश्न समानाङ्क होंगे अर्थात् प्रत्येक प्रश्न चौदह (14) अङ्कों का होगा। प्रश्न-पत्र हल करने का समयतीन (3) घण्टे होगा।
2. ***प्रथमप्रश्न*** पाठ्यक्रम के चारों घटकों में निर्धारित विषयों के आधार पर बनाया जाए। यह प्रश्न अनिवार्य होगा। इसके अन्तर्गत लघु उत्तर वाले विकल्परहित चार (4) प्रश्न पूछे जाएँ। प्रत्येक लघूत्तरात्मक प्रश्न साढे तीन (3.5) अङ्कों का होगा।
3. द्वितीय, तृतीय, चतुर्थ तथा पञ्चम प्रश्न का निर्माण पाठ्यक्रम के क्रमशः प्रथम, द्वितीय, तृतीय तथा चतुर्थ घटक में निर्धारित विषय के आधार पर किया जाए। पाठ्यक्रम के प्रत्येक घटक से दो वैकल्पिक प्रश्न देकर परीक्षार्थी से प्रत्येक घटक से एक एक प्रश्न का उत्तर लिखने को कहा जाए।

| Unit | Topics | | Contact Hours |
|---|---|---|---|
| I | श्रीमद्भगवद्गीता, द्वितीय अध्याय-<br>(क) दो श्लोकों का सरलार्थ। (2×5=10 अंक)<br>(ख) एक आलोचनात्मक प्रश्न। (4 अंक) | 14 अंक | 15 |

| | | |
|---|---|---|
| II | चरकसंहिता स्वस्थवृत्तम् सूत्रस्थान 5/71–104, 7/26–35 8/17–21, 23–29<br>14 अंक<br>(क) दो पंक्तियों की व्याख्या- (2×5=10 अंक)<br>(ख) एक निबन्धात्मक प्रश्न (4 अंक) | 15 |
| III | संस्कृत–व्याकरण : 14 अंक<br>(क) शब्द–रूप : मति, नदी, धेनु, मातृ, फल, युष्मद्, सर्व, एतद्, द्वि, त्रि। ('सर्व' से लेकर 'त्रि' तक तीनों लिङ्गों में)। (07 अंक)<br>(ख)धातु–रूप : पठ्, नश्, नृत्, प्रच्छ्, रुच्, हृ, भज्, पच्, लभ् सेव्। (केवल लट्, लोट्, लङ्, विधिलिङ्, लृट् लकारों में) (07 अंक) | 15 |
| IV | (क) छन्द: -अनुष्टुप्, आर्या, इन्द्रवज्रा, उपेन्द्रवज्रा, वंशस्थ, शिखरिणी, मन्दाक्रान्ता, वसन्ततिलका, शार्दूलविक्रीडित। 07 अंक<br>(ख) हिन्दी से संस्कृत में अनुवाद। 07अंक | 15 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:** 30 Marks<br>➢ **Theory**<br>• Class Participation: 5 Marks<br>• Seminar/presentation/assignment/quiz/class test etc.: 5+5=10 Marks<br>• Mid-Term Exam: 15 Marks | **End Term Examination:** 70 Marks |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

1 श्रीमद्भगवद्गीता , गीताप्रेस गोरखपुर
2 चरक संहिता, व्याख्याकार : आचार्य विद्याधर शुक्ल, चौखम्बा संस्कृत प्रतिष्ठान, दिल्ली
3 रचनानुवादकौमुदी – कपिलदेव द्विवेदी, विश्वविद्यालय प्रकाशन वाराणसी ।

K. Pen
Chairperson
Dept. of Sanskrit, Pali & Prakrit
Kurukshetra University,
KURUKSHETRA-136119.

10(747)

# KURUKSHETRA UNIVERSITY

# KURUKSHETRA

## Scheme of Examination and Syllabus
## For Under-Graduate Programme (Multidisciplinary) Scheme - A

## Subject: Music Vocal

**Under (Multiple Entry-Exit, Internship and CBCS-LOCF**
**in accordance to NEP-2020 w.e.f.**
**2023-24 (in phased manner)**

10(748)

**Second Year Semester-III**

| Course | Paper(s) | Nomenclature of paper | Credit (T) | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A3/ CC-M3 | B23-BMV-301 | General Introduction to Musical forms , terms and Techniques | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6 hrs. | 04 |
| MDC-3 | B23-BMV-302 | Hindustani Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 01 | 05 | 20 | 25 | 6 hrs. | 02 |

# KURUKSHETRA UNIVERSITY

# KURUKSHETRA

## Scheme of Examination and Syllabus
## For Under-Graduate Programme (Multidisciplinary)

## Subject: Music Instrumental (Sitar) Scheme-A

**Under (Multiple Entry-Exit, Internship and CBCS-LOCF**
**in accordance to NEP-2020 w.e.f.**
**2023-24 (in phased manner)**

10(750)

## Semester-III

| Course | Paper(s) | Nomenclature of paper | Credits | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A3/ CC-M3 | B23-BMI-301 | Ragas, Forms and Terms of Indian Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6 hrs. | 04 |
| MDC-3 | B23-BMI-302 | Forms of Vocal and Instrumental Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 01 | 05 | 20 | 25 | 6 hrs. | 02 |

**DEPARTMENT OF MUSIC (IIHS) KURUKSHERTRA**
**UNIVERSITY KURUKSHETRA**

**SCHEME OF EXAMINATION according to CBCS LOCF**

1 credit =25 marks , 1lecture = 1credit, 1Tutorial=1 credit ,2 Practical =1 credit

**B.A. General (Music) Vth SemesterSkill**
**Enhancement Course**

| Papers Category | Code | Nomenclature | L+T+P | Credits | Time | Marks External | | Internal | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Theory | Practical | | |
| Skill Enhance ment Course | SECM 351 | Techniques of stage performance, recording studiowork and electronic media (Theory) | 2+0+0 | 2 | 3 Hours | 40 | | 10 | 50 |
| Total | | | 2+0+0 | 2 | 3 | 40 | | 10 | 50 |

**B.A. General (Music)**
**SEMESTER: Vth**

**Skill Enhancement Course (SEC)**

**SECM 351: Techniques of stage performance, recording studio work andelectronic media**

**Credit: 2**
**Time: 3Hrs.** **Max. Marks: 50 (40 + 10 I.A.)**

**Course Learning Outcome**

1 The students will be able to describe the principals and techniques of recording.

2 The students will be able to explain the importance of electronic media in popularizing music.

3 The students will be able to present their performance according to thetechniques of the stage.

**NOTE:** There shall be eight questions in all. The candidate shall be required to attempt four questions, selecting at least one question from each section. All questions carry equal marks.

**Syllabus and course of reading**

**SECTION - A**

**Principles & Techniques of Recording**

- Definition of Recording.
- Origin and development of recording system.
- Importance of Recording place (Open & Studio)

**SECTION - B**

**Music and Media**

- Importance of Internet in Popularizing the Indian Music.

- Role of Television in Popularizing the Indian Music.
- Description of L.P Recording, Tape Cassettes, CD/DVD, Micro Chips etc.

## SECTION – C

### Basic Principles of Stage Performance

- Psychology of Audience and its Relationship with the Artists.
- Relationship between Performer and accompanists.
- Modern trends of Stage performance in Indian Music.

**Books Recommended**


1. Sangeet Visharad- Basant
2. Kramik Pustak Mallika- Part II V. N. Bhatkhande
3. Sangeet Bodh – Sharad Chandra Pranjpayee
4. Shastriya Sangeet ka vikas – Dr. Amita Sharma
5. Mixing secrets (for the small studio) - Mike Senior
6. Also Books Recommended by the teachers.

# KURUKSHETRA UNIVERSITY KURUKSHETRA

# Scheme of Examination and Syllabus for M.Sc. (5-Year Integrated) Biotechnology

## Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020 w.e.f. 2023-24 (in phased manner)

**DEPARTMENT OF BIOTECHNOLOGY, KURUKSHETRA UNIVERSITY, KURUKSHETRA**
**FIFTH YEAR**

FIFTH YEAR: SEMESTER-9

| Course | Paper(s) | Nomenclature of Paper | Credits | Hours/ Week | Internal marks | External Marks | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| CC-PG1 4 credit | B23-BTY-901 | Plant Biotechnology | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| CC-PG2 4 credit | B23-BTY-902 | Genomics, Proteomics and Metabolobics | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| CC-PG3 4 credit | B23-BTY-903 | Molecular Genetics | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| DSE-PG1 4 credit Select one Option | B23-BTY-904/704 | Molecular Diagnostics | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| | B23-BTY-905/705 | Biotechnology in Environment Protection | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| PC-PG1 4 credit | B23-BTY-906 | Practical | 4 | 8 | 30 | 70 | 100 | 6 hrs. |
| CC-HM3 4 credit | From Available Minor of 4 credits as per NEP | | | | | | | |

SEMESTER-10 (FOR STUDENTS WHO HAVE DONE HONOURS IN BIOTECHNOLOGY IN FOURTH YEAR)

| Course | Paper(s) | Nomenclature ofPaper | Credits | Hours/ Week | Internal marks | External Marks | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| CC-PG 4 4 credit | B23-BTY-1001 | Food Biotechnology | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| CC-PG 5 4 credit | B23-BTY-1002 | Animal Biotechnology | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| Project/ Dissertation 12 credit | B23-BTY-1003 | Project/ Dissertation | 12 | - | - | - | 300 | - |
| CC-HM4 4 credit | From Available Minor of 4 credits as per NEP | | | | | | | |

OR SEMESTER-10 (FOR STUDENTS WHO HAVE DONE HONOURS WITH RESEARCH IN BIOTECHNOLOGY IN FOURTH YEAR)

| Course | Paper(s) | Nomenclature of Paper | Credits | Hours/ Week | Internal marks | External Marks | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| CC-PG4<br>4 credit | B23-BTY-1001 | Food Biotechnology | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| CC-PG 5<br>4 credit | B23-BTY-1002 | Animal Biotechnology | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| CC-PG6<br>4credits | B23-BTY-1004/803 | Enzyme Technology | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| DSE-PG 2<br>4 credits<br>Select any one | B23-BTY-1005/804 | Bioinformatics-II | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| | B23-BTY-1006/805 | Mathematics and calculations in Biotechnology | 4 | 4 | 30 | 70 | 100 | 3 hrs. |
| PC-PG2 | B23-BTY-1007 | Practical | 4 | 8 | 30 | 70 | 100 | 6 hrs. |
| CC-HM2<br>4 credit | From Available Minor of 4 credits as per NEP | | | | | | | |

# KURUKSHETRA
# UNIVERSITY KURUKSHETRA

# Scheme of Examinations and Syllabus for Under-Graduate Programme

## Bachelor of FASHION & TEXTILE DESIGN

## Interdisciplinary SCHEME-D

## Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020

### w.e.f. 2023-24 (in phased manner)

# SEMESTER-1

| Course | Paper(s) | Nomenclature of Paper | Credits | Hours/ Week | Internal marks | External Marks | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| **CC-A1 4 credits** | B23-FTD-101 | Basics of design & illustration | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Basics of design & Illustration Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-B1 4 credit** | B23-FTD-102 | Basics of Sewing | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Basics of Sewing Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-C1 4 credit** | B23-FTD-103 | Textile Science & Care | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Textile Science & Care lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-M1 2 credit** | B23-HSE-101 | Home and Interior Décor | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| **MDC-1 3 credits** | From the courses offered by D/C/I | | | | | | | |
| **AEC-1 2 credit** | | From available AEC-1 pool list of 2 credits as per NEP | | | | | | |
| **SEC-1 3 credit** | | From available SEC-1 pool list of 3 credits as per NEP | | | | | | |
| **VAC-1 2 credit** | | From available VAC-1 pool list of 2 credits as per NEP | | | | | | |

# SEMESTER-2

| Course | Paper(s) | Nomenclature of Paper | Credits | Hours/ Week | Internal marks | External Marks | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| **CC-A2 4credit** | B23-FTD-201 | Concept of Fashion | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Concept of Fashion Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-B2 4 credit** | B23-FTD-202 | Basics of Clothing Construction | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Basics of Clothing Construction Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-C2 4 credit** | B23-FTD-203 | Fabric Construction | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Fabric Construction Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-M2 2 credit** | B23-HSE-201 | Nutrition Science | 2 | 2 | 15 | 35 | 50 | 3hrs. |
| **MDC-2 3 credits** | From the courses offered by D/C/I . | | | | | | | |
| **AEC-2 2 credit** | | From available AEC-2 pool list of 2 credits as per NEP | | | | | | |
| **SEC-2 3 credit** | | From available SEC-2 pool list of 3 credits as per NEP | | | | | | |
| **VAC-2 2 credit** | | From available VAC-2 pool list of 2 credits as per NEP | | | | | | |

**Internship of 4 credits of 4-6 weeks duration after 2nd semester**

# SEMESTER-3

| Course | Paper(s) | Nomenclature of Paper | Credits | Hours/ Week | Internal marks | External Marks | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| **CC-A3 4 credit** | B23-FTD-301 | Indian Traditional Art | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Indian Traditional Art lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-B3 4 credit** | B23-FTD-302 | Women Clothing-I | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Women Clothing-I Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-C3 4 credit** | B23-FTD-303 | Apparel Production Techniques | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Apparel Production Techniques Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-M3 4 credit** | B23-FTD-304 | Branding & Sales Promotion | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Branding & Sales Promotion Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **MDC-3 3 credits** | From the courses offered by D/C/I | | | | | | | |
| **AEC-3 2 credit** | | From available AEC-3 pool list of 2 credits as per NEP | | | | | | |
| **SEC-3 3 credit** | | From available SEC-3 pool list of 3 credits as per NEP | | | | | | |

# SEMESTER-4

| Course | Paper(s) | Nomenclature of Paper | Credits | Hours/ Week | Internal marks | External Marks | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| **CC-A4 4 credit** | B23-FTD-401 | Textile Chemistry | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Textile Chemistry Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-B4 4 credit** | B23-FTD-402 | Women Clothing- II | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Women Clothing- II Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-C4 4 credit** | B23-FTD-403 | Apparel Production-Draping & Grading | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Apparel Production-Draping & Grading Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-M4(V) 4 credit (2+2)** | | From available VOC-4 pool list of 4 credits as per NEP | | | | | | |
| **AEC-4 2 credit** | | From available AEC-4 pool list of 2 credits as per NEP | | | | | | |
| **VAC-3 2 credit** | | From available VAC-4 pool list of 2 credits as per NEP | | | | | | |

**Internship of 4 credits of 4-6 weeks duration after 4th semester(if not done after 2nd sem)**

# SEMESTER-5

| Course | Paper(s) | Nomenclature of Paper | Credits | Hours/ Week | Internal marks | External Marks | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| **CC-A5 4 credit** | B23-FTD-501 | Traditional Costumes | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Traditional Costumes Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-B5 4 credit** | B23-FTD-502 | Men's Clothing | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Men's Clothing Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-C5 4 credit** | B23-FTD-503 | Fabric Ornamentation Techniques | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Fabric Ornamentation Techniques Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-M5 (V) 4credit (2+2)** | | From available VOC-5 pool list of 4 credits as per NEP | | | | | | |
| **Skill enhancement course** | **INTERNSHIP #4 credits** | | | | | | | |

**#4 credits of internship, earned by a student during summer internship after 2nd semester or 4th semester, will be taken into account in 5th semester of the students who pursue three-year UG Programme without taking exit option**

# SEMESTER-6

| Course | Paper(s) | Nomenclature of Paper | Credits | Hours/ Week | Internal marks | External Marks | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| **CC-A6 4 credit** | B23-FTD-601 | Marketing & Merchandising | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Marketing & Merchandising Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-B6 4 credit** | B23-FTD-602 | Crochet & Macrame Making | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Crochet & Macrame Making Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-C6 4 credit** | B23-FTD-603 | Dyeing & Printing | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Dyeing & Printing Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-M6 4 credit** | B23-HSE-601 | Family Dynamics and Counselling | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | Family Dynamics and Counselling Lab | 1 | 2 | 10 | 20 | 30 | 4 hrs. |
| **CC-M7(V) 4credit (2+2)** | | From available CC-M7(V) pool list of 4 credits as per NEP | | | | | | |

## Semester 1

| Session: 2023-24 | | | |
|---|---|---|---|
| **PartA - Introduction** | | | |
| Subject | Bachelor of Fashion & Textile Design | | |
| Semester | I | | |
| Name of the Course | Basics of Design and Illustration | | |
| Course Code | B23-FTD-101 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-A1 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 12th pass | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1.To acquire knowledge of various concepts of fashion illustration<br>2.To know the concept of colours and its importance<br>3.To acquire knowledge about principals of design<br>4.To impart knowledge about fashion figures<br>5*.To impart students knowledge about sketching and designing on sheet | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 Hrs |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 20(T)+10(P)=30**<br>**End Term Exam Marks :50(TH) 20(P) =70** | | **Time:3hrs(T)**<br>**4hrs(P)** | |
| | | | |

| Part B-Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter: The examiner will set nine questions in all, selecting two questions from each unit and one compulsory.**<br><br>**Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well.** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | • Introduction to art media and its applications – different art media like pencils, pencil colours, crayons,poster colours, erasers, acrylic rendering and shading skills<br>• Design – definition and types. | 12 |
| II | • Elements of art and design – line, form, shape, space, size, texture and colour.<br>• Principles of design – harmony, proportion, balance, rhythm and emphasis. | 9 |
| III | Colour, dimension of colour, hue, value, intensity, colour schemes- their importance and application.<br>• Introduction and brief history of fashion illustrations. | 12 |
| IV | • Fashion model drawing – basic human proportion, body figures and shapes and sketching postures<br>• Optical illusions created through elements of art and principles of design. | 12 |
| V* | • The basic drawing and rendering of equipment using pencils, crayons, poster colours, water colours, pencil colours<br>• Figure Stylization – Illustrations – Basic croquis, division of the body to make the 8, 10 and 12 head croquis (front, side and ¾th profile)<br>• Figure in motion- normal standing, walking, running and sitting<br>• Figure drawing in S, T, X, Y poses.<br>• Colour – Preparation of colour wheel, grey scales, colour schemes, tints and shades.<br>• Creation of motifs using different forms and shapes.<br>• Designing of following motifs and its types in different colour ways<br>a. Geometrical | 30 |

| | | |
|---|---|---|
| | b. Realistic<br>c. Natural<br>d. Stylized<br>e. Vertical<br>f. Horizontal<br>g. Half Drop<br>h. All over<br>i. Diagonal<br>• Sketching of: Caps, face, eye, nose, lips, hands, legs and hairstyles. | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:05<br>• Mid-Term Exam: 10<br><br>➢ **Practicum**<br>• Class Participation: 00<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**50**<br><br>**20** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. Fashion Illustration, Anna Kiper, David & Charles Book, 2011
2. Fashion Illustration Children, Patric, John Ireland, BT Bastford Ltd, 2005
3. New Fashion Illustration (New Illustration Series) English, Paperback, Martin Dawber 2006

4. Bina Abling. Fashion Sketch Book. Fairchild Publications.1994.
5. Druid Elisabeth and Pace Tiziana. Figure Drawing for Fashion Design. Peplin Press.2004
6. Ireland Patrick John. Fashion Design Drawing and Presentation. Batsford. 2005.
7. MckelvyKathrynanadMunslow Janine. Illustrating Fashion, Blackwell Publishing. 2004.
8. Ray Smith. Drawing Figures. Dorling Kindersley. 1994.

**Semester 1**

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A– Introduction** | | | |
| Subject | Bachelor of Fashion & Textile Design | | |
| Semester | 1 | | |
| Name of the Course | Basics of Sewing | | |
| Course Code | B23-FTD-102 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-B1 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 12th pass | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. To make students get aware about basic sewing skills.<br>2. To impart knowledge about sewing , pressing .<br>3. To enhance creative skills.<br>4. To make sure students about sewing and constructing the garments.<br>5* To enhance students skills in sewing and impart knowledge about various sewing projects | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100**<br>**Internal Assessment Marks:20(TH)10(P) =30**<br>**End Term Exam Marks:50(TH)20(P) =70** | | **Time:3hrs (TH)**<br>**4hrs (P)** | |

| Part B-Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter: The examiner will set nine questions in all, selecting two questions from each unit and one compulsory.**<br><br>**Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well.** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | • Introduction to Sewing, Sewing Equipments and their function.<br>• Terminology: Stitches, Grain, Grainline, Off-grain, On-Grain,Bais, Seamallowances, Seams, Measuring Tools.<br>• Sewing machine, its Parts and their Function.<br>• Threading a machine. Common problems and methods to overcome. | 12 |
| II | • Introduction to Industrial Sewing machine, its different types and their Function.<br>• Temporary & Permanent Stitches - Temporary stitches: basting- even, uneven and diagonal. Permanent stitches: hemming, slip stitching, blanket, and fagoting.<br>Making terminologies & symbols (notches, punch/circles,) Pattern information (grain, part, piece, cut symbols) seam allowance, fabric terms (grain, Bowing).<br>• Explain Seams & Seam Finishes , type of seam finishes and their application | 12 |
| III | • Define Fullness and its types - Darts, Tucks, Pleats, Gathers, Shirring, Ruffles and Godets<br>• Yokes – Definitions, purpose with and without fullness, applications and construction.<br>• Sleeves – definition, terms and types. | 12 |
| IV | • Collars – definition, terms, types and styles.<br>• Different types of Pockets.<br>• Different types of Skirts. | 9 |

| | | |
|---|---|---|
| V* | **Sample Making of the following basic hand stitches:**<br>○ **Temporary Stitches:** Basting- Even & Uneven, Diagonal, Slip and Pin basting<br>○ **Permanent:** Running, Hemming, Backstitch, Whipping and Button hole<br><br>**Machine Stitching:**<br>**Seams:** Topstitch seam, Counter, Lapped seam, Run n fell seam and French seam<br>**Finishes:** Edge stitched, Overcast and Bound seam<br>**Facing(**straight and bias**) & Bindings**<br>**Sample Making of the following :**<br>**Pleats-** Knife, Inverted, Accordion and Box pleats<br>**Darts-** Half and Full dart<br>**Neck Lines-** Round, Square, V Shape etc.<br>**Tucks-** Pin, Cross<br>**Gathers-** By Hand & Machine, elastic and bobbin elastic<br>**Placket**-Continuous wrap placket, two piece placket, kurta placket, trouser fly and slit opening<br><br>**Pocket**–Inseam pocket, Kurta pocket and Patch pocket<br>**Fasteners** –Buttons & button hole, Shirt buttons- with and without shank, Press buttons, Hooks & eye and Zippers (close ended, open ended and concealed) | 30 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:05<br>• Mid-Term Exam: 10<br><br>➢ **Practicum**<br>• Class Participation: 00<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**50**<br><br>**20** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. Cutting & Sewing Theory, GayathriVerma & Kapil Dev, Asian Publishers, 2015
2. Garment Technology for Fashion Designers, Gerry Conklin, Wiley-Blackwell, USA, 2012
3. Garment Manufacturing Technology, EIRI Board, Engineers India Research Institute
4. Donaghy Deshpande. Basic Process and Clothing construction. Raj Prakash an.

5. Colton. (1987). Complete Guide to Sewing by Readers Digest.
6. Readers Digest sewing Book.

*Applicable for courses having practical component.

## Semester 1

| Session: 2023-24 | |
|---|---|
| **Part A– Introduction** | |
| Subject | Bachelor of Fashion & Textile Design |
| Semester | 1 |
| Name of the Course | Textile Science and Care |
| Course Code | B23-FTD-103 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-C1 |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | 12TH |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. To create awareness on textile science.<br>2. To impart knowledge about different types of textiles fibers natural and manmade fibers.<br>3. To enhance skills of the students in fiber identification.<br>4. To make students aware of fabric care.<br>5*.To enhance skills in lab by various experiments and |

| | | | |
|---|---|---|---|
| | get deep knowledge of textiles. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100**<br>**Internal Assessment Marks:20(TH)10(P) =30**<br>**End Term Exam Marks:50(TH) 20(P) = 70** | | **Time:3hrs (TH)**<br>**4hrs(P)** | |

**Part B-Contents of the Course**

**Instructions for Paper- Setter: The examiner will set nine questions in all, selecting two questions from each unit and one compulsory.**

**Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well**

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Terminology- Fibre, Yarns, Linear Density, Strength, Crease recovery, abrasion resistance, drapability, tensile strength, static charge, thermal conductivity.<br>Introduction to textile fibers, classification of fibers based on sources and origin, basic textile terminology.<br>Properties of textile fibers. | 12 |
| II | Manufacturing process and properties of various natural cellulosic fibres- cotton & linen.<br>Manufacturing process and properties of various natural protein fibers-wool & silk.<br>Manufacturing process and properties of regenerated and modified cellulosic fibre.<br>Rayon<br>Acetate | 12 |
| III | Manufacturing process of man-made synthetic fibers:-<br><br>Polyamide – Nylon 66, Nylon6<br><br>Polyester<br><br>Acrylic<br><br>Classification of yarns :- carded and combed yarns, woolen & | 12 |

| | | |
|---|---|---|
| | worsted yarns, filaments and spun yarns.<br>Yarn properties, linear density, size, twist in yarn, crimp yarn direction, strength & uniform. | |
| IV | Textile yarn:- Types and application, fancy yarns- Types & Uses.<br>Physical Properties of Fabric- Strength, Abrasion Resistance, Crease Recovery, Stiffness, Drapability, Static Charge, Air Permeability, Water Repellency, Thickness, Shrink Resistance, Pilling Resistance.<br>Methods of determining the physical properties and interpretation of test results. | 9 |
| V* | 1. Fiber Identification: - Visual, Burning, Microscopic & Solubility test.<br><br>2. Fiber blend Analysis.<br><br>3. Identification of types of yarn.<br><br>4. Evaluation of thread count.<br><br>5. Evaluation of dimensional stability of fabric.<br><br>6. Evaluation of color fasteners to Washing, Ironing & Sunlight.<br><br>7. Evaluation of Crimp & Twist in yarn.<br><br>8. Remove of different stains from fabric surface.<br><br>9. Washing & finishing of Fabric made of cotton. | 30 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:05<br>• Mid-Term Exam: 10<br><br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10 | | **End Term Examination:**<br>**50**<br><br>**20** |

| | |
|---|---|
| • Mid-Term Exam: | |
| **Part C-Learning Resources** | |
| **Recommended Books/e-resources/LMS:**<br><br>Vilensky "Textile Science" CBS publisher, New Delhi, 1999.<br>Grosicki, Z: "Watson's Textile Design and color" Blackwell Science, U.K.,1998.<br>Mishra S.P., "A text book of fiber science and technology, New Age Intt., Delhi 2000.<br>GoswamiB.c. "Textile Yarns", Technology, structure and applications", Mc graw Hill.<br>Pizzoto's J.J., "Fabric Science", Fairchild publication, New York. | |

*Applicable for courses having practical component.

**SEMESTER-1**

| **Session: 2023-24** | |
|---|---|
| **Part A–Introduction** | |
| Subject | Bachelor of Fashion & Textile Design |
| Semester | 1 |
| Name of the Course | Home and Interior Decor |
| Course Code | B23-HSE-101 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M1 |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | 12TH |

| | | | |
|---|---|---|---|
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. To make students aware of needle work .<br>2. To get knowledge about different manual skills with needles.<br>3. To make students more efficient for doing intricate work manually.<br>4. To make aware of different types of needle craft all over the India.<br>5*.To make students aware of needle work and get knowledge about different manual skills with needles | | |
| Credits | Theory | Practical | Total |
| | 2 | - | 2 |
| Contact Hours | 2 | - | 3 Hrs |
| **Max. Marks:50**<br>**Internal Assessment Marks:15(TH)**<br>**End Term Exam Marks:35(TH)** | | **Time: 3hrs(T)** | |

**Part B-Contents of the Course**

**Instructions for Paper- Setter:** The examiner will set nine questions in all, selecting four questions from each unit and one compulsory objective type question.

**Instructions for the candidate:** The candidates will attempt five questions in all, selecting at least one question from each unit as well as compulsory questions.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Objectives of interior decoration, importance of elements of art in interior decoration. **Types of design:** structural and decorative and its application. **Elements of art:** line, form, texture, light, pattern, colour, space and its application in interior decoration | 10 |

| | | |
|---|---|---|
| II | **Principles of design:** Rhythm, balance, proportion, emphasis, harmony and its application in interior decoration<br>**Colour:** Properties of colour, psychological effect of colour, color schemes and its application in the interior of a house.<br>**Lighting:** a) Types and requirement for various activities b) Lighting fixtures in the home | 10 |
| III | **Table setting and table manners:** Informal and formal table settings (buffet style, Indian style restaurant style, Cafe style)<br>**Furniture:** Types of furniture, furniture arrangement for different areas (bedroom, drawing room, dining room, kitchen and its types) Factors affecting the selection and purchase of furniture, care and maintenance of furniture. | 10 |
| IV | **Flower arrangement:** a) Different types of Flower arrangement b) Accessories used and points to be considered for flower arrangement<br>c) Flower decoration for different occasions **Furnishings: a) S**oft Furnishing (curtains, cushions, pillow and material for upholstered furniture) b) Wall treatment and its types c) Window treatment and decoration d) Types of floor coverings | 10 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: 04<br>● Seminar/presentation/assignment/quiz/class test etc.:00<br><br>➢ Mid-Term Exam: 06<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:10 | **End Term Examination: 20**<br><br>**15** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. Seetharaman P.(2019), Interior Design And Decoration,India:CBS.
2. M.Pratap Rao (2020),Interior Design: Principles And Practice, India, Standard Publishers and Distributors Pvt Ltd
3. Frida Ramstedt (2020), The Interior Design Handbook: Furnish, Decorate, and Style Your Space,Clarkson Potter publishing.
4. Dr. Bhargava B. (2007), Principles of art,University Book House Pvt. Ltd.
5. Lawrence M, (1987), Interior Decoration, New Jersey: Chartwell Books.
6. Riley &Bayen., (2003), The Elements of Design, Mitchell Beazley.
7. Rutt Anna Hong (1961): Home furnishing,Wiley Eastern Pvt.Ltd.
8. Bhat Pranav and Goenka Shanita (1990): The foundation of art and Design, Bombay: Lakhani Book Depot.


*Applicable for courses having practical component.

## ANNEXURE-I

## Levels of Courses

**Levels of Courses:** Courses shall be coded based on the learning outcomes, level of difficulty, and academic rigor. The coding structure is as follows:

**0-99:** Pre-requisite courses required to undertake an introductory course which will be a pass or fail course with no credits. It will replace the existing informal way of offering bridge courses that are conducted in some of the colleges/ universities.

**100-199:** Foundation or introductory courses that are intended for students to gain an understanding and basic knowledge about the subjects and help decide the subject or discipline of interest. These courses may also be prerequisites for courses in the major subject. These courses generally would focus on foundational theories, concepts, perspectives, principles, methods, and procedures of critical thinking in order to provide a broad basis for taking up more advanced courses. These courses seek to equip students with the general education needed for advanced study, expose students to the breadth of different fields of study; provide a foundation for specialized higher-level coursework; acquaint students with the breadth of (inter) disciplinary

fields in the arts, humanities, social sciences, and natural sciences, and to the historical and contemporary assumptions and practices of vocational or professional fields; and to lay the foundation for higher level coursework.

**200-299:** Intermediate-level courses including subject-specific courses intended to meet the credit requirements for minor or major areas of learning. These courses can be part of a major and can be pre-requisite courses for advanced-level major courses.

**300-399:** Higher-level courses which are required for majoring in a disciplinary/interdisciplinary area of study for the award of a degree.

**400-499:** Advanced courses which would include lecture courses with practicum, seminar-based course, term papers, research methodology, advanced laboratory experiments/software training, research projects, hands-on-training, internship/apprenticeship projects at the undergraduate level or First year Postgraduate theoretical and practical courses.

**500-599:** Courses at first-year Master's degree level for a 2-year Master's degree programme

**600-699:** Courses for second-year of 2-year Master's or 1-year Master's degree programme

**700 -799 & above:** Courses limited to doctoral students

**Semester 2**
**Bachelor of Fashion & Textile Design**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A – Introduction** | | | |
| Subject | Bachelor of Fashion & Textile Design | | |
| Semester | 2 | | |
| Name of the Course | Concept of fashion | | |
| Course Code | B23-FTD-201 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-A2 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 12th pass | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1.To acquire knowledge of various concepts of fashion<br>2.To know the concept of origin of clothing<br>3.To equip with different fashion theories<br>4.To impart knowledge about fashion Psychology<br>5*.to impart knowledge to students about the different styles of fashion | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100**<br>**Internal Assessment Marks:20(T)+10(P)=30**<br>**End Term Exam Marks:50(T) +20(P) =70** | | **Time:3hrs(T)**<br>**4hrs (P)** | |

| Part B-Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter :The examiner will set nine questions in all, selecting two questions from each unit and one compulsory question as well**<br>**Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Fashion terminology/ Terms related to the fashion industry –fashion, style, fad, classic, boutique, trends, designer, silhouette, Hi- Fashion, Fashion/selling seasons and collection, chic Custom made , mannequin , fashion , show, trend, forecasting, high fashion, fashion cycle, haute couture, couture, couturier, fashion director, fashion editor, line, knock-off avantgarde, bridge, buying house, apparel, fashion merchandising, pre –a –porter, sample. Fashion origin and evolution. Fashion cycle and differentiation on the basis of length of fashion cycle.<br><br>Types of fashion: haute couture, Prêt-a-porter and Mass Fashion. | 12 |
| II | Elements of design –line, shape or form, colour , size and texture. Application of structural and decorative design in a dress, selection and application of trimmings and decorations. Principles of design -balance –formal and informal, rhythm-through repetition, radiation and gradation, emphasis, harmony and proportion.<br><br>Application of principles of design in a dress.<br><br>Design-definition and types– structural and decorative design, requirements of a good structural and decorative design. Colour-definition, colour theories-prang colour chart, Dimensions of colour-hue, value, and intensity. Standard colour harmonies-application in dress design.<br><br>Principles of fashion. | 12 |

| | | |
|---|---|---|
| III | Levels of Fashion Acceptance-Fashion leader, fashion role model, fashion follower, Fashion victims.<br><br>Fashion theories- trickle down, trickle across and bottom up theory.<br><br>Factors affecting and influencing fashion | 12 |
| IV | Fashion Inspiration and categories / Fashion seasons and their duration<br><br>International Fashion center's and Worldwide Popular Fashion designers<br><br>Study of Indian designers – Tamil Nadu, Maharashtra, Rajasthan, Karnataka and Uttar Pradesh and International designers – France, Germany, U.S, United Kingdom and Italy (any one popular designer) | 9 |
| V* | * Illustrate<br>• outfit for a special occasion<br>• outfit for different climate<br>• long -term fashion style<br>• short-term fashion style<br>• clothing of any two eras<br>• casual wear for women by using lines ,shapes ,and textures<br>• using crayons and poster colour draw fashion cycle stages | 30 |
| | | |

| Suggested Evaluation Methods | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:05<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**50**<br><br>**20** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

**Reference Link**: https://swayam.gov.in/ Learner support Material: NPTEL, Swayam (https://swayam.gov.in), E-library, E-books, online PDF material etc.

**Reference Books**:


1. Kathryn Mikelvey, "Fashion source book", Blackwed science, UK
2. Sharon Le Fate, "Inside Fashion Design", Harper and Row Pub. NY.
3. Carter L, "The changing World of Fashion," G.P. Panama's Sons, NY
4. Second skin, "Horn MJ, 1981,
5. Study of clothing, "Houghm Mifflin Company, Bosien
6. Kafgen Mary, Individuality in clothing, Houghton Mifflin Company
7. Dynamics of fashion by Elaine stone


*Applicable for courses having practical component.

**SEMESTER 2**

| Session: 2023-24 | |
|---|---|
| **Part A – Introduction** | |
| Subject | Bachelor of Fashion & Textile Design |
| Semester | 2 |
| Name of the Course | Basics of Clothing Construction |

| | | | |
|---|---|---|---|
| Course Code | B23-FTD-202 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-B2 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 12th Pass | | |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to: Understand the fundamentals of professional sewing and apparel construction techniques. Students learn basic cutting, sewing and finishing by hand and by machine | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks: 100**<br>**Internal Assessment Marks:20(T)+10(P)=30**<br>**End Term Exam Marks:**50(T)+ 20(P)=70 | | **Time:3hrs(T)**<br>**4hrs(P)** | |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter: The examiner will set nine questions in all, selecting two questions from each unit and one compulsory question as well**

**Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well**

| Unit | Topics | Contact Hours |
|---|---|---|
| I | • Principles of clothing:- Socio- Psychological aspects of clothing.<br>• How dress affects behaviour<br>• First impression | 12 |

| | | |
|---|---|---|
| | • Fabric Preparation.<br>• Handling special fabrics.<br>Suitability of different fabrics for different garments | |
| II | • Terminology related to skirts, trousers, collars, sleeves.<br>• Clothing for different age groups.<br>• Clothing for different occasions. | 12 |
| III | • Fabric estimation and its importance. Principles of fitting, factors to be considered while fitting, common fitting problems, remedying fitting defects.<br>• Flow chart of garment manufacturing. | 9 |
| IV | **ACCESSORIES:-**Labels, Lining, interlining facing & interfacing, Wadding, Lace, Braid, elastic, hook and loop fastening , shoulder pads, eyelets and laces, zip fasteners, buttons . | 12 |
| V* | **Drafting of Basic Bodice Block and sloper making of:-**<br>• Children - Front/Back<br>Yoks- Round, square, symmetrical and asymmetrical<br>Collars- Peterpan, shawl, sailor, mandarin, cape collar, stand and fall.<br>**Construct Types of Sleeves and Sleeve Finishes**<br>• Basic sleeve types, Half sleeve, Full sleeve, 3/4 sleeve<br>**Set insleeves**<br>(i) Plain<br>(ii) Puffsleeve<br>(iii) Flaresleeve<br>(iv) Cap sleeve<br>**Drafting and construction of Layette set :-**<br>Bib, Diaper, Panty, Bloomer, Jhabla | 30 |
| **Suggested Evaluation Methods** | | |

| Internal Assessment: | End Term Examination |
|---|---|
| • **Theory**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:05<br>• Mid-Term Exam: 10 | **50** |
| • **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam: NA | **20** |

**PartC-Learning Resources**

**Recommended Books/e-resources/LMS:**

Text books:


• Carp and Latham. The Technology of Clothing Manufacture.
• Greff and Strom. Concepts of Clothing.
• Thomas Anna Jacob: “The Art of Sewing”. New Delhi, USB Publisher Distributors Ltd.1994.
• Reader’s Digest “Complete Guide to Sewing”.1995.
• Cooklin Grey. Garment Technology for Fashion Designer, Blackwell Science, 1997
Thomas Anna Jacob, “The art of sewing", USB publishers New Delhi, 1994.
• Readers Digest sewing book.
• Verma G., cutting & tailoring theory", Asian publishers Delhi, 1999.
• CooklinG ,Garment Technology for Fashion Designers” Blackwell publishing ,1977


*Applicable for courses having practical component.

**SEMESTER-2**

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A – Introduction** | | | |
| Subject | Bachelor of Fashion & Textile Design | | |
| Semester | 2 | | |
| Name of the Course | Fabric Construction | | |
| Course Code | B23-FTD-203 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-C2 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 12TH PASS | | |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be learnTo create awareness on conversion of yarns, and fibres, into a fabric having characteristics determined by the materials and methods employed. Most fabrics are presently produced by some method of interlacing, such as weaving or knitting | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |

| | | | |
|---|---|---|---|
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100**<br>**Internal Assessment Marks:20(T)+ 10(P)=30**<br>**End Term Exam Marks:**50(T) + 20(P)=70 | | **Time:3hrs (T)**<br>**4hrs(P)** | |

**Part B- Contents of the Course**

**Instructions for Paper- Setter: The examiner will set nine questions in all, selecting two questions from each unit and one compulsory question as well**

**Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well**

| Unit | Topics | Contact Hours |
|---|---|---|
| I | * Terminology- Woven Fabric, Warp, Weft, Fabric Balance, Fabric Weight, Blended Fabric, Fabric Density, Selvedge & its types.<br>*Different methods of Fabric Formation- Weaving, | 12 |

| | | |
|---|---|---|
| | Knitting, Felting, Bonding, Lace-Making, Knotting.<br>*Introduction to Weaving Preparatory- Winding, Wraping, Sizing &Pirn Winding. | |
| II | *Introduction of Looms & its Parts<br>*Basic Loom-<br>• Parts of a simple looms & its Functions<br>• Basic motion of Weaving<br>*Different Types of Looms<br>• Shuttle Loom<br>• Shuttleless Loom (Rapier, Gripper, Multiphase, Air jet, Water jet | 12 |
| III | *Preparation of yarns for weaving<br>*Weaving- Plain Weave, Twill weave & Satin, influence of these weaves on fabric characteristics.<br>*Plain Weave- Warp & Weft, Basket, Rib & their influence on fabric characteristics. | 12 |
| IV | * Twill weave- Pointed, Herring Bone & Diamond Twill. Regular & Irregular Satin weaves and their application in Fabric.<br>Fancy Decorative Weaves - Dobby, Jacquard, pile, Leno, Swivel & Double Weave.<br>*Woven Fabric Defects- Float, Lashing in, Missing End, Selvedge Defects. | 9 |
| V* | 1. To Prepare the sample on the hand loom<br>• Plain, Twill & Satin<br>• Pile Cut<br><br>2. Prepare sample of Macrame Knots<br>• Half Hitch Knot, Double Hitch Knot<br>• Square Knot, Overhand Knot<br>• Lark's Head Knot, Reverse Lark's head Knot<br><br>3. Preparation of a articles using above Techniques.<br>4. Visit to Textile Industry in India. | 30 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **InternalAssessment:**<br>• **Theory**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:05<br>• Mid-Term Exam: 10<br>• **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam: | **End Term Examination:**<br>50<br><br>20 |

| Part C-Learning Resources |
| --- |
| • **Recommended Books/e-resources/LMS:** Thomas Anna Jacob,“The art of sewing”,USB publisher New Delhi, 1994.<br>• Readers Digest sewing book.<br>• Verma G., “Cutting & tailoring theory”, Asian publishers Delhi, 1999.<br>• Cooklin G, “Garment Technology for Fashion Designers”, Blackwell publishing, 1977.<br>• Corbman,“Textile Fibre to Fabric”, Mc Graw Hill(1967). |

*Applicable for courses having practical component.

| SEMESTER-2 | | | |
|---|---|---|---|
| **Session: 2023-24** | | | |
| **Part A - Introduction** | | | |
| Subject | Bachelor of Fashion & Textile Design | | |
| Semester | 2 | | |
| Name of the Course | Nutrition Science | | |
| Course Code | **B23-HSC-201** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/ VOC/DSE/PC/AEC/VAC) | CC-M2 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 12th PASS | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1.To understand basic concepts of nutrition & importance of water & carbohydrates.<br>2. To understand the functions, sources, requirements and effects of excess and deficiency of different nutrients.<br>3 The students will be able to know the functions, sources, requirements and effects of excess and deficiency of different vitamins.<br>4. To understand the functions, sources, requirements and effects of excess and deficiency of different minerals. | | |
| Credits | **Theory** | **Practical** | **Total** |
| | **2** | **-** | **2** |
| Contact Hours | **2** | **-** | **2** |
| **Max. Marks:50**<br>**Internal Assessment Marks: 15 (T)**<br>**End Term Exam Marks: 35(T)** | | **Time:3hrs (T)** | |
| **Part B- Contents of the Course** | | | |
| **Instructions for Paper- Setter :** The examiner will set nine questions in all, selecting two questions from each unit and one compulsory question as well.<br>**Instructions for the Candidate:** The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well. | | | |
| **Unit** | **Topics** | | **Contact Hours** |

| | | |
|---|---|---|
| I | Definition of Nutrition, nutrients, recommended dietary allowance, balanced diet, health, reference man & reference woman and BMR-Definition and factors affecting BMR<br>Water: Functions and sources of water for human body Carbohydrates: Classification, functions, sources & requirement, effects of deficiency and excess (in brief)<br>Fibre -Types, functions, sources & requirement and health problems associated with excess and deficiency of fiber | 10 |
| II | Protein: Classification, functions, sources & requirement Fats/ Lipids: Classification, functions, sources and requirements and health problems associated with excess and deficiency of lipids. Vitamins: Definition & classification of vitamins, difference between fat soluble & water soluble vitamins Fat soluble vitamins: Functions, sources, recommended dietary allowances, effects of excess & deficiency (in brief) of:Vitamin A,D,E & K | 11 |
| III | Functions, sources, recommended dietary allowances, effects of excess & deficiency (in brief) of various water soluble vitamins: Vitamin C, Vitamin B1 (Thiamine), Vitamin B2, (Riboflavin), Vitamin B6 (Pyridoxine), Vitamin B12 (Cyanocobalamin), Niacin and Folic acid. | 11 |
| IV | Definition and Classification of minerals Macro minerals: Functions, Sources, RDA, Effect of Excess and low intake of Calcium,Phosphorus, Magnesium, Sodium and Potassium Micro Minerals: Functions, sources and RDA, Effect of Excess and low intake of Iron, Iodine Fluorine & Zinc | 10 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment: Theory**<br>● Class Participation: **04**<br>● Seminar/presentation/assignment/quiz/class test etc.:**04**<br>● Mid-Term Exam: **07** | | **End Term Examination: 35** |

## Part C-Learning Resources

**Recommended Books/e-resources/LMS:**


1. Srilakshmi, B. (2017). Nutrition Science. New Age International Limited, Publishers, New Delhi.
2. Agarwal,A. and Udipi, S. (2014). Text Bookof Human Nutrition, Jaypee Medical Publication, New Delhi.
3. Bamiji, M.S.; Rao, N.P. and Reddy, V. (Editors) (1999). Textbook of Human Nutrition. New Delhi: Oxford and IBH Publishing Co. Pvt. Ltd.
4. ICMR (2010). Nutrient Requirements and Recommended Dietary Allowance for Indians. A Report of the Expert Group of ICMR. NIN, Hyderabad.
5. Maney S (2008). Foods, Facts and Principles, 3 rd Edition Published by Wiley Eastern, New Delhi.
6. Mahtab, S. Bamji, Kamala Krishnasamy, Brahmam G.N.V (2012) Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi.
7. SunetraRoday (2017). Food Science and Nutrition, Oxford University Press, New Delhi.
8. Longvah, T, Ananthan, R., Bhaskarachary, K., Venkaiah, K (2017). Indian Food Composition Tables (IFCT), Indian Council of Medical Research, National Institute of Nutrition, Hyderab.
9. Raina U, Kashyap S, Narula V, Thomas S Suvira, VirS, Chopra S (2010) Basic Food Preparation: A Complete Manual, 4th Edition, Orient Black Swan Ltd, Mumbai.

## ANNEXURE-I

## Levels of Courses

**Levels of Courses:** Courses shall be coded based on the learning outcomes, level of difficulty, and academic rigor. The coding structure is as follows:

**0-99:** Pre-requisite courses required to undertake an introductory course which will be a pass or fail course with no credits. It will replace the existing informal way of offering bridge courses that are conducted in some of the colleges/ universities.

**100-199:** Foundation or introductory courses that are intended for students to gain an understanding and basic knowledge about the subjects and help decide the subject or discipline of interest. These courses may also be prerequisites for courses in the major subject. These courses generally would focus on foundational theories, concepts, perspectives, principles, methods, and procedures of critical thinking in order to provide a broad basis for taking up more advanced courses. These courses seek to equip students with the general education needed for advanced study, expose students to the breadth of different fields of study; provide a foundation for specialized higher-level coursework; acquaint students with the breadth of (inter) disciplinary fields in the arts, humanities, social sciences, and natural sciences, and to the historical and contemporary assumptions and practices of vocational or professional fields; and to lay the foundation for higher level coursework.

**200-299:** Intermediate-level courses including subject-specific courses intended to meet the credit requirements for minor or major areas of learning. These courses can be part of a major and can be pre-requisite courses for advanced-level major courses.

**300-399:** Higher-level courses which are required for majoring in a disciplinary/interdisciplinary area of study for the award of a degree.

**400-499:** Advanced courses which would include lecture courses with practicum, seminar-based course, term papers, research methodology, advanced laboratory experiments/software training, research projects, hands-on-training, internship/apprenticeship projects at the undergraduate level or First year Postgraduate theoretical and practical courses.

**500-599:** Courses at first-year Master's degree level for a 2-year Master's degree programme

**600-699:** Courses for second-year of 2-year Master's or 1-year Master's degree programme

**700 -799 & above:** Courses limited to doctoral students

**Semester 3**
**Bachelor of Fashion & Textile Design**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A– Introduction** | | | |
| Subject | Bachelor of Fashion & Textile Design | | |
| Semester | 3 | | |
| Name of the Course | Indian Traditional Arts | | |
| Course Code | B23-FTD-301 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-A3 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 12th Pass | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. To Impart Knowledge About<br>2. Indian Traditional Arts<br>3. Indian Embroideries<br>4. Various Indian Traditional Textiles<br>5* To Impart Knowledge to Students About the Different Traditional Arts | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 20(T)+10(P)=30**<br>**End Term Exam Marks:50(T), 20(P)=70** | | **Time: 3hrs(T)**<br>**4hrs(P)** | |
| | | | |

**Part B Contents of the Course**

**Instructions for Paper- Setter: The examiner will set nine questions in all, selecting two questions from each unit and one compulsory.**
**Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well.**

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Study the following traditional arts of India:- Pattachitra, Warli Art, Tanjore Art, Gond Art, Mandala, Lippan Art | 9 |
| II | Introduction, stitches, motifs, base fabrics, thread, techniques and colour combination used in embroideries of following:<br>• Kutch Kathiawari and Sindhi of Gujrat<br>• Phulkari of Punjab<br>• Kantha of Bengal<br>• Chikankari of Lucknow<br>• Kasida of Kashmir<br>• Kasuti of Karnatak | 12 |
| III | Traditional textiles: Importance and history of hand woven textiles. Brocades, Jamavar, Dacca muslin and Jamdani, Chanderi, Maheshwari, Kanjivaram, kotaDoria and Baluchari.<br><br>Resist printed textiles: Bandhani, Patola, Ikat andPochampalli.<br>Block Printed :Dabu, Sanganeri, Ajrakh, Batik<br>Painted textile: Kalamkari and Madhubani. Regional variations in symbolic motifs. | 12 |
| IV | Woven shawls of Kashmir, Himachal Pradesh and North Eastern States. | 12 |

| | | |
|---|---|---|
| | Floor Coverings- Carpets and Durries<br><br>Textile surface ornamentation by beads, applique and ribbon. | |
| V* | **Prepare samples of following:**<br>● Basic embroidery stitches.<br>✧ Kasuti of Karnatka<br>✧ Chikankari of Uttar Pradesh<br>✧ Kantha of Bengal<br>✧ Kashida of Kashmir<br>✧ Phulkari of Punjab.<br>✧ Kutch of Gujarat.<br>✧ Sindhi of Sind.<br>● Prepare 5 samples of Tie & Dye (Cotton & Silk).<br>● Block printing, Batik, Stencil, Screen & Fabric painting.<br><br>**Prepare any two articles using any technique of surface ornamentation** | 30 |

| **Suggested Evaluation Methods** | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:05<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam: NA | **End Term Examination:**<br>50<br><br>20 |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

**REFERENCES**


• Pandit, S. 1976. Indian Embroidery: Its Variegated Charms. Baroda.

• Mehta, R.J. 1970. Masterpieces of Indian Textiles. Bombay, D.B. Taraparevala Sons and Co. Pvt.Ltd.

• Gillow. Indian Textiles.

• Lehri, R.M. Indian Embroideries.

• Ghosh. Ikat Textiles of India

• Shailza, D. Naik. Traditional Embroideries of India

- SodhiaManmeet, "Dress Designing", Kalyani publishers, New Delhi.
- Lynton Linda, " The Sari", Thames &Hadson.
- Anand M.R., "Textiles & Embroideries of India " Marg Publication Bombay, 1965.
- NaikShailaja D, " TraditionalEmbroderies of India" APH Publisher Corporation, New Delhi, 1996.
- Chattopadhyay K, " Indian Embroidery", Wiley Eastern Ltd., New Delhi,


*Applicable for courses having practical component.

**SEMESTER-3**

| Session: 2023-24 | | | |
|---|---|---|---|
| **PartA – Introduction** | | | |
| Subject | Bachelor of Fashion & Textile Design | | |
| Semester | 3 | | |
| Name of the Course | Women Clothing- I | | |
| Course Code | B23-FTD-302 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-B3 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 12th Pass | | |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. To acquire Knowledge of Various Concepts of Fashion<br>2. To Know the Concept of origin of clothing<br>3. To equip with different fashion theories<br>4. To impart knowledge to the students and making them perfect in drafting and construction of various no article<br>5* To impart knowledge to students about the different styles of women's clothes. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 20(T)+10(P)=30**<br>**End Term Exam Marks:50(T), 20(P)=70** | | **Time: 3hrs(T)**<br>**4hrs(P)** | |

| Part B-Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter: The examiner will set nine questions in all, selecting two questions from each unit and one compulsory.**<br><br>**Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well.** | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Body measurements: anthropometric measures and methods of taking proper body measurements for different garments.<br>General principles of clothing construction<br>Factors affecting clothing requirements | 12 |
| II | Selection of fabric for different garments according to different figure type<br>Handling of special fabrics such as plaid, checks, stripes denims etc.<br>Types of fitting problems, factors to be considered while identifying fitting problems . | 12 |
| III | Clothing of women for different occasions<br>Importance of scarves in women clothing<br>Importance of accessories in women clothing | 9 |
| IV | Planning assembly of women's wear; assessing quality at various stages of garment assembly<br>Classification of women's wear<br>Brands in women's wear | 12 |
| V* | Drafting of basics skirt block<br>Preparation of different types of skirt:<br>A- line skirt<br>Circular skirt<br>Gored skirt<br>Drafting and construction of petticoat<br>Drafting and construction of simple kameez<br>Drafting and construction of any type of salwar<br>Drafting and construction of simpleplazo/ sharara | 30 |
| **Suggested Evaluation Methods** | | |

| | |
|---|---|
| Internal Assessment:<br>➢ Theory<br>• Class Participation:05<br>• Seminar/presentation/assignment/quick class test etc,;05<br>• Mid-Term Exam:10<br>➢ Practicum<br>• Class Participation:<br>• Seminar/ Dernonstration Viva-voce Lab records etc.:10 | End Examination:<br>50<br><br>20 |
| • Mid-Term Exam:NA | |

**PartC-Learning Resources**

Recommended Books/e-resources/LMS':

Reference Link: https://swayam.gov.in/ Learner support Material: NP'IVL Swayam (https://swayarn.gov.in), E-library, E-books, online PDF material etc.

**Reference Books :**


1. Carr and lather- The of clothing manufacture
2. gains s and Singer sewing machine
3. Gioello and break. Figure types and size ranges
4. Aldrich Winifred. Matric pattern cutting 011 book service 1997. Ko
5. Armstrong Il pattern making for fashion design. Longman 2tng
6. Bray Natalia. More drøs pattern designing lackwell scenes2001
7. Apparelonline.com in


*Applicable for courses having practical component.

**SEMESTER-3**

| Session: 2023-24 | | | |
|---|---|---|---|
| **PartA–Introduction** | | | |
| Subject | Bachelor of Fashion & Textile Design | | |
| Semester | 3 | | |
| Name of the Course | Apparel Production Techniques | | |
| Course Code | B23-FTD-303 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-C3 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 12th Pass | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. To create an awareness about the types of garment machine available in the industry<br>2 To develop an understanding about the selection of the right machine for production of the required garment.<br>3. To expose the students to the latest practices and technological world of garment production | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 20(T)+10(P)=30**<br>**End Term Exam Marks:50(T), 20(P)=70** | | **Time: 3hrs(T)**<br>**4hrs(P)** | |
| **Part B-Contents of the Course** | | | |

| **Instructions for Paper- Setter: The examiner will set nine questions in all, selecting two questions from each unit and one compulsory.**<br><br>**Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well** | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | **Apparel production process**<br>o Pattern, Grading and Marker making<br>o Spreading<br>o Cutting<br>o Ticketing<br>o Sewing<br>o Finishing<br>o Quality checking | 12 |
| II | **Spreading and Cutting operations, machines and their functions**<br>Marker planning: drawing &reproduction of the marker<br>Spreading of the fabric to form a lay<br>Cutting of the fabric<br>Sorting, numbering, ticketing, bundling | 12 |
| III | **Stitching operations with its specialized machines**<br>Components of sewing: needle, throat plate, feed dog and threads etc<br>Seam types: classification<br>Stitch types: classification<br>Sewing machine needles and threads<br>Sewing machines: single lock machines, buttonhole & buttoning machine, bar tacking | 9 |
| IV | **Finishing & Packaging**<br>Importance of Pressing<br>Equipments for pressing<br>Fusing Machinery & Requirements of Fusing<br>Packaging Shipping & Merchandising Packaging<br>Packaging Tags & Fasteners<br><br>**Garment Finishing and Inspection**<br>Attaching Buttons: Marking & Sewing<br>Labels<br>Cleaning | 12 |

| | | |
|---|---|---|
| | Final Touches | |
| V* | ✧ Body Ideals, Infants, Children, Man, Woman, (Standard Measurement)<br>✧ Preparing Basics Blocks, Front Back, Sleeve, Skirt, Trouser, for Woman.<br>✧ Developing draft for men's garments, men's shirt, Trouser<br>✧ Introduction to grading drafting and grading of basic block<br>✧ Development of variation in sleeves and bodies combination (at least 5)<br>✧ Procedure for grading block to various sizes children – bodies block sleeves, skirts, trouser,<br>✧ Make samples of fasteners, placket, center button closing, asymmetrical closing | 30 |
| **Suggested Evaluation Methods** | | |
| Internal Assessment:<br>➢ Theory<br>• Class Participation:05<br>• Seminar/presentation/assignment/quick class test etc,;05<br>• Mid-Term Exam:10<br>➢ Practicum<br>• Class Participation:<br>• Seminar/ Demonstration viva-voce lab records etc.:10 | | End Examination: 50<br><br>20 |
| • Mid-Term Exam:NA | | |
| | | |

| Part C-Learning Resources |
| --- |
| Recommended Books/e-resources/LMS':<br><br>**REFERENCES:**<br>1. Bheda, R. Managing Productivity in the Apparel Industry. New Delhi: CBS publishers and Distributers 2003.<br>2. Cooklin G., Garment for Fashion Designers. United Kingdom: Blackwell Publishing Limited 1997.<br>3. Cooklin G., Introduction to Clothing Manufacture. United Kingdom: Blackwell Publishing Limited. (Second Edition) 2006.<br>4. Giocello, D.A. and B. Prerke Fashion Production Terms. New York Fairchild Publication 2004.<br>5. Solinger, J.. Apparel Manufacturing Analysis. New York: Textile Book Publishers Inc. 1961<br>6. Care, H. and B.Latham, The Technology of clothing Manafucture United Kingdom: Blackwell Science Limited 2004. |

*Applicable for courses having practical component.

**SEMESTER-3**

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A– Introduction** | | | |
| Subject | Bachelor of Fashion & Textile Design | | |
| Semester | 3 | | |
| Name of the Course | BRANDING AND SALES PROMOTION | | |
| Course Code | B23-FTD-304 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M3 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 12th Pass | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>• To impart knowledge regarding branding process.<br>• To know about various brands and brand management.<br>• To learn various fashion promotional techniques | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 20(TH) 10(P)=30**<br>**End Term Exam Marks:50(TH) 20(P)=70** | | **Time: 3hrs(T)**<br>**4hrs(P)** | |
| | | | |

| Part B-Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter:** The examiner will set nine questions in all, selecting two questions from each unit and one compulsory.<br>**Instructions for the Candidate:** The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | **Branding:**<br>o Meaning, definition and importance of branding in fashion industry<br>o Fashion branding(FAQ)<br>o Creating content for fashion brand.<br>o Building a brand (step by step guide) | 12 |
| II | **Brand Management:**<br>• Steps and technique;<br>• Rules of Branding<br>• Benefits of building a strong Brand<br>• Pillars of Branding | 12 |
| III | **Sales Promotion:**<br>o Definition and importance of Sales Promotion<br>o Various Sale promotion techniques and methods<br>o Components of sales promotion<br>o Factors affecting and retarding sales promotion | 9 |

| | | |
|---|---|---|
| IV | **Goals of sales promotion:**<br>• Marketing and Branding together<br>• Various government policies of branding<br>Role of branding in promoting sales | 12 |
| V* | ✧ Window Display for a specific store and boutique according to different occasions and seasons<br>✧ Sourcing of fabrics, fasteners, and trims<br>✧ Survey on famous brands available in Market<br>✧ Layout Design and illustration for different kinds of store display. | 30 |
| **Suggested Evaluation Methods** | | |
| Internal Assessment:<br>➢ Theory<br>• Class Participation:05<br>• Seminar/presentation/assignment/quick class test etc,; 05<br>• Mid-Term Exam:10<br>➢ Practicum<br>• Class Participation:<br>• Seminar/ Demonstration viva-voce lab records etc.:10 | | End Examination:<br>50<br><br>20 |
| • Mid-Term Exam:NA | | |
| **Part C-Learning Resources** | | |
| Recommended Books/e-resources/LMS':<br>**REFERENCES:**<br>• Fashion promotion: Building a brand through marketing and communication (by Gwyneth moore)<br>• Marketing fashion (by Harriet posner) | | |

- Fashion brands (by Mark Tungate)
- Fashion branding and communication edited by ByounghoJin and Elena
- Luxury fashion branding (by Uche Okonkwo)
- Fashion branding Unraveled (by Kaled K. Hameide)

*Applicable for courses having practical component.

## ANNEXURE-I

## Levels of Courses

**Levels of Courses:** Courses shall be coded based on the learning outcomes, level of difficulty, and academic rigor. The coding structure is as follows:

**0-99:** Pre-requisite courses required to undertake an introductory course which will be a pass or fail course with no credits. It will replace the existing informal way of offering bridge courses that are conducted in some of the colleges/ universities.

**100-199:** Foundation or introductory courses that are intended for students to gain an understanding and basic knowledge about the subjects and help decide the subject or discipline of interest. These courses may also be prerequisites for courses in the major subject. These courses generally would focus on foundational theories, concepts, perspectives, principles, methods, and procedures of critical thinking in order to provide a broad basis for taking up more advanced courses. These courses seek to equip students with the general education needed for advanced study, expose students to the breadth of different fields of study; provide a foundation for specialized higher-level coursework; acquaint students with the breadth of (inter) disciplinary fields in the arts, humanities, social sciences, and natural sciences, and to the historical and contemporary assumptions and practices of vocational or professional fields; and to lay the foundation for higher level coursework.

**200-299:** Intermediate-level courses including subject-specific courses intended to meet the credit requirements for minor or major areas of learning. These courses can be part of a major and can be pre-requisite courses for advanced-level major courses.

**300-399:** Higher-level courses which are required for majoring in a disciplinary/interdisciplinary area of study for the award of a degree.

**400-499:** Advanced courses which would include lecture courses with practicum, seminar-based course, term papers, research methodology, advanced laboratory experiments/software training, research projects, hands-on-training, internship/apprenticeship projects at the undergraduate level or First year Postgraduate theoretical and practical courses.

**500-599:** Courses at first-year Master's degree level for a 2-year Master's degree programme

**600-699:** Courses for second-year of 2-year Master's or 1-year Master's degree programme

**700 -799 & above:** Courses limited to doctoral students.

## Semester 4

| **Session: 2023-24** | |
|---|---|
| **Part A– Introduction** | |
| Subject | Bachelor of Fashion & Textile Design |
| Semester | 4 |
| Name of the Course | Textile Chemistry |
| Course Code | B23-FTD-401 |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-A4 |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | 12th pass |

| | | | |
|---|---|---|---|
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1.To acquire knowledge of various kinds of textile chemicals and their uses<br>2.To know the concept of textile chemistry<br>3.To acquire knowledge about principals of design<br>4.To impart knowledge about fashion figures<br>5*. To impart students knowledge about sketching and designing on sheet | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks: 100**<br>**Internal Assessment Marks: 20(T)10(P)=30**<br>**End Term Exam Marks:50(TH)20(p)**=70 | | **Time:3hrs(T)**<br>**4hrs(P)** | |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

| Unit | Topics | Contact Hours |
|---|---|---|
| I | ● Introduction to textile fibers, classification of fibers based on sources and origin, basic textile terminology.<br>● Primary and secondary properties of various fibers.<br>● Sequence of operations & purposes of short/long staple yarn manufacturing<br>● process, introduction & objectives of opening & cleaning, carding, combing, drawing,<br>● roving and spinning. | 12 |
| II | ● Different methods and types of spinning.<br>● Introduction, Manufacturing & Properties of different natural and man-made fibers: -<br>● Cotton, Wool, silk, rayon, acetate and triacetate, polyamide (Nylon-6, nylon- 6.6)<br>● acrylics, modacrylic, elastomeric fibre. | 9 |

| | | |
|---|---|---|
| III | ● □ Classification of Yarns: Carded and Combed yarns, woolen & worsted yarns,<br>● filament and spun yarns.<br>● □ Yarn Properties – linear density, size, twist in yarn, crimp twist direction, strength<br>● and uniformity.<br>● □ Textured yarns – type | 12 |
| IV | Textured yarns – types and application, Fancy Yarns – types and uses.<br>● □ Physical properties of Fabric – strength, abrasion resistance, crease recovery,<br>● stiffness, drapability, static charge, thermal conductivity, air permeability, water<br>● repellency, thickness, shrink resistance, pilling resistance.<br>● □ Methods of determining the physical properties and interpretation of test results | 12 |
| V* | □□Fiber identification – visual, burning, microscopic and solubility test.<br>□□Fibre blends analysis.<br>□□Measurement and interpretation of yarn count, direct and indirect yarn.<br>□□Identification of type of yarn.<br>□□Evaluation of thread count and dimensional stability of fabric.<br>□□Evaluation of color fastness to washing and ironing.<br>□□Evaluation of crimp and twist in yarn. | 30 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:05<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam: Na | | **End Term Examination:**<br>**50**<br><br>**20** |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>□□Vilensky. "Textile Science", CBS publisher, New Delhi, 1999.<br>□□Grosicki, Z. "Watson's Textile Design and Color" Blackwell Science, U.K., 1998.<br>□□Mishra, S.P. "A textbook of fiber science and technology, New Age Intt., Delhi 2000.<br>□□Goswami, B.C. "Textile Yarns", Technology, structure, and applications", Mc graw Hill.<br>□□Pizzoto's J.J. "Fabric Science", Fairchild Publication, New York. |

*Applicable for courses having practical component.

**SEMESTER-4**

| Session: 2023-24 | |
|---|---|
| **Part A– Introduction** | |
| Subject | Bachelor of Fashion & Textile Design |
| Semester | 4 |
| Name of the Course | Women Clothing II |
| Course Code | B23-FTD-402 |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-B4 |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | 12TH |

| | | | |
|---|---|---|---|
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. To impart knowledge about terminology related to women clothing.<br>2. To enhance skills in drafting and construction<br>3. To get students aware of clothing for special needs<br>4. 5*. To make them capable of doing drafting, constructing of women clothing | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100**<br>**Internal Assessment Marks:20(T)+10(P)=30**<br>**End Term Exam Marks:50(T), 20(P)=70** | | **Time:3hrs**<br>**4hrs** | |

**Part B-Contents of the Course**

**Instructions for Paper- Setter: The examiner will set nine questions in all, selecting two questions from each unit and one compulsory.**

**Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well**

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Terminology used in Drafting & Pattern Making<br>Flat Pattern Making, Template Working Patterns, Production Patterns, Design Specification Sheet, Pattern Chart, Cost-Sheet, Grain, Dart, Dart legs, Dart intake, Vertical Lines, Horizontal Lines, Symmetric and Asymmetric Lines, Style Number, Pattern Size.<br>A Study of Tools & Equipments<br>Measuring Tools<br>Marking Tools<br>Cutting Tools | 12 |

| | | |
|---|---|---|
| II | Developing paper patterns:<br>a) Understanding the commercial paper pattern.<br>b) Layout on different fabrics, widths & types. | 12 |
| III | Fitting – factors affecting good fit, common problems encountered and remedies for fitting defects (upper and lower garments)<br>Clothing for people with special needs.<br>a) Maternity and lactation period<br>b) Old age | 9 |
| IV | ● A study of Anthropometric<br>List of Measurements<br>Taking Body Measurement<br>Standard Size Chart<br>● Pattern Development: Drafting, Flat Patterns, Slash and Spread and Pivot Methods<br>● Fabric Estimations and its importance<br>● Fitting: Good Fitting, Fitting Problems and their solution.<br>● Basics of Commercial Paper Pattern<br>Pattern Envelop<br>Pattern Making<br>Pattern Layout | 12 |
| V* | Drafting and construction of:<br>1. Ladies trousers<br>2. Circular Skirt<br>3. Top with dart manipulation<br>4. Princess line Blouse<br>5. Evening gown<br>6. Night suit | 30 |
| **Suggested Evaluation Methods** | | |

| | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:05<br>• Mid-Term Exam: 10<br><br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**50**<br><br>**20** |
| **PartC-Learning Resources** | |
| **Recommended Books/e-resources/LMS:**<br>• Carr and Lather. The technology of clothing manufacture.<br>• Bains, S. and Hutton, J. Singer Sewing Book.<br>• Gioello and Brake. Figure types and size ranges.<br>• Aldrich Winifred. Metric pattern cutting. Om book services.1997.<br>• Armstrong II. J. Pattern making for fashion design. Longman. 2003.<br>• Bray Natalia. More dress pattern designing. Blackwell science. 2001.<br>• Cooklin Grey. Pattern making for women's outer wear. Blackwell sciences,1997 | |

*Applicable for courses having practical component.

## SEMESTER-4

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A– Introduction** | | | |
| Subject | Bachelor of Fashion & Textile Design | | |
| Semester | 4 | | |
| Name of the Course | Apparel Production- Draping and Grading | | |
| Course Code | B23-FTD-403 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-C4 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (ifany) | 12th pass | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1.To acquire knowledge of techniques of draping of fabrics<br>2.To know the design and construct garments using the principles of draping.<br>3.To acquire knowledge about grading<br>4. To know the method of garment construction according<br>Industrial level_____<br>5*. To impart students knowledge about sketching and designing on sheet | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |

| | | | |
|---|---|---|---|
| Contact Hours | 3 | 2 | 5 |

| | |
|---|---|
| **Max. Marks: 100**<br>**Internal Assessment Marks: 20(T)+10(P)=30**<br>**End Term Exam Marks:50 (TH), 20 (P)=70** | **Time:3hrs(T)**<br>**4hrs(P)** |

**Part B-Contents of the Course**

**Instructions for Paper- Setter: The examiner will set nine questions in all, selecting two questions from each unit and one compulsory.**

**Instructions for the Candidate: The candidates will attempt five questions in all, selecting one question from each unit and the compulsory question as well**

| Unit | Topics | Contact Hours |
|---|---|---|
| I | ● Fitting - Introduction, principles of fitting, types of garments fit, standards for a good fit, fitting, body scanner.<br>● Pattern alteration techniques - Introduction, methods of alteration technique, importance. Pivot, slash and spread method (length, width, front, back, sleeve, shirt, skirt, trousers) | 12 |
| II | ● Introduction to pattern development, manual and computerized pattern development, marker making Introduction, mini marker, marker plan development and marker efficiency.<br>● Pattern layout - Definitions, principles, types of layouts, importance of pattern layout.<br>● Fabric estimation - Definition, types of estimation, importance of fabric estimation. | 12 |
| III | ● Draping: - definition, terminology, principles of draping, preparation and uses,<br>measurement and tools used in draping.<br>● Basic Draping techniques: - front & back bodice, front &back skirt.<br>● Dart location and manipulation. | 12 |
| IV | ● Grading - Introduction, definition, grading terminologies, principles, types, sizes, grade rules and points, manual and computerized grading, importance, advantages, and disadvantages. | 9 |

| | | |
|---|---|---|
| V* | Draping: - definition, terminology, principles of draping, preparation and uses,<br>measurement and tools used in draping.<br>· Basic Draping techniques: - front & back bodice, front &back skirt.<br>· Dart location and manipulation.<br>· Designing the garment using the following construction features: -<br>1. Gathers.<br>2. Pleats.<br>3. Cowl & fancy necklines.<br>4. Collars.<br>· Designing and construction of following garments using different construction<br>and decorative features: -<br>1. Shirt/ Top (female / male)<br>2. Skirt.<br>3. Gown.<br>· Preparation of one dress using draping techniques | 30 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 05<br>• Seminar/presentation/assignment/quiz/class test etc.:05<br>• Mid-Term Exam: 10<br><br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**50**<br><br>**20** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. Fashion Illustration, Anna Kiper, David & Charles Book, 2011
2. Fashion Illustration Children, Patric, John Ireland, BT Bastford Ltd, 2005
3. New Fashion Illustration (New Illustration Series) English, Paperback, Martin Dawber 2006

4. Bina Abling. Fashion Sketch Book. Fairchild Publications.1994.
5. Druid Elisabeth and Pace Tiziana. Figure Drawing for Fashion Design. Peplin Press.2004
6. Ireland Patrick John. Fashion Design Drawing and Presentation. Batsford. 2005.
7. MckelvyKathrynanadMunslow Janine. Illustrating Fashion, Blackwell Publishing. 2004.

8. Ray Smith. Drawing Figures. Dorling Kindersley. 1994

*Applicable for courses having practical component.

## ANNEXURE-I

## Levels of Courses

**Levels of Courses:** Courses shall be coded based on the learning outcomes, level of difficulty, and academic rigor. The coding structure is as follows:

**0-99:** Pre-requisite courses required to undertake an introductory course which will be a pass or fail course with no credits. It will replace the existing informal way of offering bridge courses that are conducted in some of the colleges/ universities.

**100-199:** Foundation or introductory courses that are intended for students to gain an understanding and basic knowledge about the subjects and help decide the subject or discipline of interest. These courses may also be prerequisites for courses in the major subject. These courses generally would focus on foundational theories, concepts, perspectives, principles, methods, and procedures of critical thinking in order to provide a broad basis for taking up more advanced courses. These courses seek to equip students with the general education needed for advanced study, expose students to the breadth of different fields of study; provide a foundation for specialized higher-level coursework; acquaint students with the breadth of (inter) disciplinary fields in the arts, humanities, social sciences, and natural sciences, and to the historical and contemporary assumptions and practices of vocational or professional fields; and to lay the foundation for higher level coursework.

**200-299:** Intermediate-level courses including subject-specific courses intended to meet the credit requirements for minor or major areas of learning. These courses can be part of a major and can be pre-requisite courses for advanced-level major courses.

**300-399:** Higher-level courses which are required for majoring in a disciplinary/interdisciplinary area of study for the award of a degree.

**400-499:** Advanced courses which would include lecture courses with practicum, seminar-based course, term papers, research methodology, advanced laboratory experiments/software training, research projects, hands-on-training, internship/apprenticeship projects at the undergraduate level or First year Postgraduate theoretical and practical courses.

**500-599:** Courses at first-year Master's degree level for a 2-year Master's degree Programme

**600-699:** Courses for second-year of 2-year Master's or 1-year Master's degree programme

**700 -799 & above:** Courses limited to doctoral students

| Session: 2023-24 | |
|---|---|
| **Part A – Introduction** | |
| Subject | Bachelor of Home science |
| Semester | III |
| Name of the Course | Skin and Hair care |
| Course Code | B23-VOC-111 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | VOC |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | Senior Secondary(10+2) or equivalent in any stream |

| | | | |
|---|---|---|---|
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Analyze skin, suggest appropriate beauty regimens and perform facials, massages and other skin care treatments.<br>2. Improve personal appearance and professional skills.<br>3. Develop skills that are related to business managementand retail sales.<br>4. Apply knowledge of the skin and hair treatments and aesthetic applications with hands-on training.<br>_____<br>5* Perform specialized skin and hair care procedures, such as hair styling, facials, massage, scalp treatment, manicures and pedicures etc. | | |
| Credits | **Theory** | **Practical** | **Total** |
| | **2** | **2** | **4** |
| Contact Hours | **2** | **4** | **6** |
| **Max. Marks:100**<br>**Internal Assessment Marks:15(T) +15(P)=30**<br>**End Term Exam Marks: 35(T) +35(P)=70** | | **Time:3hrs(T)**<br>**4hrs(P)** | |
| **Part B- Contents of the Course** | | | |
| **Instructions for Paper- Setter:**The examiner will set nine questions in all, selecting four questions from each unit and one compulsory objective type question.<br>**Instructions for the candidate:** The candidates will attempt five questions in all, selecting atleast one question from each unit as well as compulsory questions. | | | |

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Skin Structure, Functions of Skin, analysis of the Skin types and pH, Skin disorders and treatment.<br>Facial masks & packs: Different type of masks and packs, benefits of Masks. | 07 |
| II | Definition, Benefits and side effects of peels/micro dermabrasion, Procedure for different skin treatments like Anti-Pigmentation, Anti-Acne, Anti-Aging, Whitening and Rejuvenating. | 08 |
| III | Structure of hair, Functions of Hair, Types of Hair, hair and scalp disorders and treatment.<br>Hair masks and spa: different types of hair masks and spa, benefits of masks. | 07 |
| IV | Introduction to Foot reflexology, and its Benefits.<br>Basic principles of Aromatherapy and oils used in massages.<br>Role of diet and exercise for radiant skin and strong hair. | 08 |
| V* | ● Basic Skin Care: Cleansing, Scrubbing, Toning, Moisturizing.<br>● Facial massage and application of bleach, facial packs and masks.<br>● Waxing, threading and tweezing.<br>● Manicure and pedicure.<br>● Basic Hair Care: Oil massaging, steaming, shampoo & conditioning.<br>● Hair styling techniques: blow drying, curling, straightening and hair crimping.<br>● Treatment for hair fall, dandruff, split-ends and graying.<br>● Homemade remedies by using vegetables, fruits and other ingredients from kitchen for skin and hair care (facial cream, masks, shampoo, hair conditioner etc.) | 52 |
| **Suggested Evaluation Methods** | | |

| Internal Assessment: | End Term Examination: |
|---|---|
| ➢ **Theory**<br>● Class Participation:**04**<br>● Seminar/presentation/assignment/quiz/class test etc.:**04**<br>● Mid-Term Exam:**07**<br>➢ **Practicum**<br>● Class Participation:**05**<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:**10**<br>● Mid-Term Exam:**NA** | **35**<br><br>**35** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Anatomy & Physiology: Beauty Therapy Basics – Helen McGuinness.
- The Skin Care Answer Book 1st Edition by Mark Lees .
- Milady's Standard Cosmetology, by Milady.
- Beauty Therapy: The Foundation Level II, by Lorraine Nordmann.
- The science of Hair Care – John Wilkinson.

# Kurukshetra University, Kurukshetra

**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

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(Perform Actions while Stead fasting in the State of Yoga)

Scheme of Examination and Syllabus of Bridge Course (For students who have not studied Computer Science at 10+2 level or at Graduation level) for

Master of Computer Application (MCA)(CBCS & Non-CBCS)

SEMESTER - I

## DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

CBCS & Non-CBCS CURRICULUM (2023-24)

Program Name: Bridge Course (For students who have not studied Computer Science at 10+2 level or at Graduation level) for Master of Computer Applications (MCA)

(CBCS & Non-CBCS)

(For the Batches Admitted w.e.f. 2023-2024)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

## VISION

Pursue conducive advancement towards nurturing globally competent and ethically conscientious professionals and entrepreneurs in agile computing technologies and allied spheres for unceasing evolution of Nations IT affiliated commercial and research endeavours.

## MISSION

Thrive to establish a strong foundation for technical competency in spheres concordant to software oriented design and development. Nurture skills and competency for administering expertise gained in computing discipline to a wide horizon of interdisciplinary application domains, thus supporting sustainable development of the society. Habituate the students to strive for technological innovations and successful endeavours ethically, supported by sustained learning continuance and problem solving proficiency that may promote nations welfare in terms of economic acceleration leading to the growth of society.

**NAME OF THE PROGRAMME:**
**BRIDGE COURSE (FOR STUDENTS WHO HAVE NOT STUDIED COMPUTER SCIENCE AT 10+2 LEVEL OR AT GRADUATION LEVEL) FOR MASTER OF COMPUTER APPLICATIONS**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**SCHEME OF EXAMINATIONS FOR**
**BRIDGE COURSE**
**(FOR STUDENTS WHO HAVE NOT STUDIED COMPUTER SCIENCE AT 10+2 LEVEL OR AT GRADUATION LEVEL)**
**FOR**
**MASTER OF COMPUTER APPLICATIONS**
**(CBCS & Non-CBCS)) 1ST SEMESTER**
**W. E. F. ACADEMIC SESSION 2023-24**

| Paper Code | Nomenclature of Paper | Credits | Workload Per Week (Hrs.) | Exam Time (Hrs.) | External Marks | | Internal Marks | Total Marks | Pass Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Max. | Pass | | | |
| **First Semester** | | | | | | | | | |
| MCA-BC-23-11 | Computer Fundamentals and Problem Solving Through C | 0 | 4 | 3 | 75 | 30 | 25 | 100 | 40 |
| MCA-BC-23-12 | S/W Lab Based on MCA-BC-23-11 | 0 | 2 | 3 | 50 | 20 | - | 50 | 20 |
| | **Total** | **0** | **6** | | **125** | **50** | **25** | **150** | **60** |

***Note 1:** Evaluation procedure for internal assessment marks:
Two Mid Term Examinations should be conducted by the concerned teacher each of 10 marks. Five marks may be given by the concerned teacher on the basis of performance during the course (puzzles/ assignments/ interactions/ attendance etc.).

**Note 2**: Size of groups in all practical courses should not be more than thirty students.
**Note 3**: To be qualified for the MCA degree, candidates (except belonging to Note 4) are required to pass the Bridge course. However, the marks obtained, although shown on the final year grade sheet, will not be added to the CGPA/SGPA.
**Note 4:** The students who have passed computer science as a major subject in graduation/ 10+2 level/ any diploma course from a recognized university are not required to do the bridge course in first semester.

| MCA-BC-23-11: Computer Fundamentals and Problem Solving Through C | |
|---|---|
| **Type:** Bridge Course (For students who have not studied computer science before taking admission to MCA)<br>**Course Credits:** 0<br>**Contact Hours:** 4 hours/week<br>**Examination Duration:** 3 Hours<br>**Mode:** Lecture<br>**External Maximum Marks:** 75<br>**External Pass Marks:** 30(i.e. 40%)<br>**Internal Maximum Marks:** 25<br>**Total Maximum Marks:** 100<br>**Total Pass Marks:** 40(i.e. 40%) | **Instructions to paper setter for End semester exam:**<br>Total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective type questions from complete syllabus. In addition to compulsory first question there shall be four units in the question paper each consisting of two questions. Student will attempt one question from each unit in addition to compulsory question. All questions will carry equal marks. |
| **Course Objectives**: This course is designed to get the students equipped with the fundamentals of computer science. This course will help the students to develop the problem solving skills through a well-known language C. | |
| **UNIT – I**<br>Computer Fundamentals: Basics of computers, basic computer organization, storage hierarchy, storage devices, input-output devices. Computer Software. Introduction to operating systems.<br>Planning the computer program: Purpose of program planning, algorithm, flowcharts, decision tables, pseudocodes.<br>**UNIT – II**<br>Digital Fundamentals: Information representation - number systems, number system conversion; Computer codes - BCD code, EBCDIC code, ASCII, Unicode; Binary arithmetic; Binary logic - Boolean algebra, Boolean functions, truth table, simplification of Boolean functions (upto 4 variables only), K-map, digital logic gates.<br>**UNIT – III**<br>Elements of C language: C character set, identifiers & keywords, data types: declaration & definition. Operators: Arithmetic relational, logical, bitwise, unary, assignment and conditional operators & their hierarchy & associativity, Data input/output. Control statements: Sequencing, Selection: if and switch statement; iteration: for, while, and do-while loop; break, continue, goto statement.<br>**UNIT – IV**<br>Functions in C language: Definition, prototype, passing parameters, recursion, Data structure: arrays, structures, union, string, data files. Pointers: Declaration, operations on pointers, array of pointers, pointers to arrays. | |
| **Text Books:**<br>1. Yashwant Kanitkar, Let us C, BPB Publications.<br>2. Pradeep k. Sinha & Priti Sinha, Computer Fundamentals, BPB Publications<br>3. Byron S Gottfried, Programming with C, Tata McGrawhill | |
| **Reference Books:**<br>1. Rajaraman V, Fundamentals of Computers, PHI<br>2. R.G. Dromey, How to solve it by Computer, Pearson Education,<br>3. Hanly J R & Koffman E.B, Problem Solving and Programm design in C, Pearson | |

# Kurukshetra University, Kurukshetra

**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थः कुरु कर्माणि ||
समबुद्धि व योग युक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Scheme of Examination and Syllabus of Bridge Course (For students who have not studied Mathematics at 10+2 level or at Graduation level) for

Master of Computer Application (MCA)(CBCS & Non-CBCS)

SEMESTER - II

## DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

CBCS & Non-CBCS CURRICULUM (2023-24)

Program Name: Bridge Course (For students who have not studied Mathematics at 10+2 level or at Graduation level) for Master of Computer Applications (MCA)

(CBCS & Non-CBCS)

(For the Batches Admitted w.e.f. 2023-2024)

10(828)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

## VISION

Pursue conducive advancement towards nurturing globally competent and ethically conscientious professionals and entrepreneurs in agile computing technologies and allied spheres for unceasing evolution of Nations IT affiliated commercial and research endeavours.

## MISSION

Thrive to establish a strong foundation for technical competency in spheres concordant to software oriented design and development. Nurture skills and competency for administering expertise gained in computing discipline to a wide horizon of interdisciplinary application domains, thus supporting sustainable development of the society. Habituate the students to strive for technological innovations and successful endeavours ethically, supported by sustained learning continuance and problem solving proficiency that may promote nations welfare in terms of economic acceleration leading to the growth of society.

**NAME OF THE PROGRAMME:**
**BRIDGE COURSE (FOR STUDENTS WHO HAVE NOT STUDIED MATEHMATICS AT 10+2 LEVEL OR AT GRADUATION LEVEL) FOR MASTER OF COMPUTER APPLICATIONS**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**SCHEME OF EXAMINATIONS FOR**
**BRIDGE COURSE**
**(FOR STUDENTS WHO HAVE NOT STUDIED MATHEMATICS AT 10+2 LEVEL OR AT GRADUATION LEVEL)**
**FOR**
**MASTER OF COMPUTER APPLICATIONS**
**(CBCS & Non-CBCS) 2ND SEMESTER**
**W. E. F. ACADEMIC SESSION 2023-24**

| Paper Code | Nomenclature of Paper | Credits | Workload Per Week (Hrs.) | Exam Time (Hrs.) | External Marks | | Internal Marks | Total Marks | Pass Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Max. | Pass | | | |
| **Second Semester** | | | | | | | | | |
| MCA-BC-23-21 | Mathematical Foundations for Computer Science | 0 | 4 | 3 | 75 | 30 | 25 | 100 | 40 |
| MCA-BC-23-22 | S/W Lab Based on MCA-BC-23-21 | 0 | 2 | 3 | 50 | 20 | - | 50 | 20 |
| | **Total** | **0** | **6** | | **125** | **50** | **25** | **150** | **60** |

***Note 1:** Evaluation procedure for internal assessment marks:
Two Mid Term Examinations should be conducted by the concerned teacher each of 10 marks. Five marks may be given by the concerned teacher on the basis of performance during the course (puzzles/ assignments/ interactions/ attendance etc.).
**Note 2**: Size of groups in all practical courses should not be more than thirty students.
**Note 3**: To be qualified for the MCA degree, candidates (except belonging to Note 4) are required to pass the Bridge course. However, the marks obtained, although shown on the final year grade sheet, will not be added to the CGPA/SGPA.
**Note 4:** The students who have passed mathematics/statistics as a major subject in graduation/ 10+2 level from a recognized university are not required to do the bridge course in second semester.

| MCA-BC-23-21: Mathematical Foundations for Computer Science | |
|---|---|
| **Type:** Bridge Course (For students who have not studied mathematics at 10+2/graduation)<br>**Course Credits:** 00<br>**Contact Hours:** 4 hours/week<br>**Examination Duration:** 3 Hours<br>**Mode:** Lecture<br>**External Maximum Marks:** 75<br>**External Pass Marks:** 30(i.e. 40%)<br>**Internal Maximum Marks:** 25<br>**Total Maximum Marks:** 100<br>**Total Pass Marks:** 40(i.e. 40%) | **Instructions to paper setter for End semester exam:**<br>Total number of questions shall be nine. Question number one will be compulsory and will be consisting of short/objective type questions from complete syllabus. In addition to compulsory first question there shall be four units in the question paper each consisting of two questions. Student will attempt one question from each unit in addition to compulsory question. All questions will carry equal marks. |
| **Course Objectives:** The objective of this paper is to make the students familiar with the commonly used mathematics and statistics in the field of computer science. | |
| **Unit – I**<br>Sets: Set theory: Basic concept, set types, set operations, cardinality, and notation.<br>Relations: Relations and its representations, Properties of binary relation –Reflexive, symmetric, Asymmetric, transitive, Equivalence, Inverse & Composition of a relation, closure of relations, its types, Partial ordering relation, Hasse diagram, minimal elements, upper bound, lower bound, Lattices<br>Functions: definition, floor functions, ceiling functions, surjective, injunctive and bijective functions, Inverse Function, Composition of functions, recursive Functions, Pigeon hole principles and its application. | |
| **Unit – II**<br>Addition and multiplication of matrices, Laws of matrix algebra, Singular and non-singular matrices, Inverse of a matrix, Systems of linear equations, Eigen values and Eigen vectors, Diagonalization of a square matrix.<br>Interpolation, Numerical Integration and Differentiation. | |
| **Unit – III**<br>Statistical Methods: Definition and scope of Statistics, concepts of statistical population and sample. Data: Quantitative and qualitative, attributes, variables, scales of measurement nominal, ordinal, interval and ratio. Presentation: tabular and graphical, including histogram and ogives.<br>Measures of Central Tendency: Mean, Median, Mode. Measures of Dispersion: range, quartile deviation, mean deviation, standard deviation, coefficient of variation, Moments, skewness and kurtosis. | |
| **Unit – IV**<br>Bivariate data: Definition, scatter diagram, simple, partial and multiple correlation (3 variables only), rank correlation. Simple linear regression, principle of least squares and fitting of polynomials and exponential curves.<br>Probability: Introduction, random experiments, sample space, events and algebra of events. Definitions of Probability – classical, statistical, and axiomatic. Conditional Probability, laws of addition and multiplication, independent events, theorem of total probability, Bayes' theorem and its applications. | |
| **Text Books:** | |

1. Gupta, S. C. and Kapoor, V.K. : Fundamentals Of Mathematical Statistics, Sultan Chand &Sons
2. Seymour Lipschutz, Marc Lars Lipson, Discrete mathematics, McGraw-Hill international editions, Schaum's series.
3. V. Rajaraman, Computer-Oriented Numerical Methods., PHI

**Reference Books:**

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Tata McGraw – Hill
2. Hogg, R.V., Tanis, E.A. and Rao J.M. : Probability and Statistical Inference, Seventh Ed, Pearson Education, New Delhi.
3. Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I & II, The World Press, Kolkata.
4. Babu Ram: Discrete Mathematics
5. Shanti Narayana : Differential & Integral calculus

LIST OF VALUE AIDED COURSES APPENDIX-I

| Semester | Course Type | Course Code | Nomenclature of paper | Credits | Credits | | Contact hours | Internal Assessment marks | | End term Exam. Marks | | Max. Marks | Duration of End Term exam. (Hrs T / P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Theory (T) | Practical (P) | T+P | T | P | T | P | | |
| 4 | VAC-4 | B23-VAC-402 | Art of Happiness | 2 | 2 | NA | 2 | 15 | 00 | 35 | 00 | 50 | 3 |
| | VAC-4 | B23-VAC-411 | Social and Emotional Learning | 2 | 2 | NA | 2 | 15 | 00 | 35 | 00 | 50 | 3 |
| | VAC-4 | B23-VAC-416 | Emotional Intelligence | 2 | 2 | NA | 2 | 15 | 00 | 35 | 00 | 50 | 3 |
| | VAC-4* | B23-VAC-424 | Science of Happiness and Wellbeing | 2 | 2 | NA | 2 | 15 | 00 | 35 | 00 | 50 | 3 |

*Kurukshetra University Campus only.

**KURUKSHETRA UNIVERSITY**
**Undergraduate Programs (Psychology) Syllabus, Semester –IV**

**VAC-4**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Psychology | | |
| Semester | IV | | |
| Name of the Course | Art of Happiness | | |
| Course Code | B23-VAC-402 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | VAC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | - | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. get awareness regarding nature, sources and factors affecting happiness.<br>2. understand the role of culture in happiness and relationship happiness and money.<br>3. develop insight about happiness as a intrinsic value, age relationship with happiness and ways to increase happiness.<br>4. know about key indicators and index of happiness, and status of happiness in India. | | |
| Credits | Theory | Practical | Total |
| | 2 | NA | 2 |
| Contact Hours | 2 | NA | 2 |
| **Max. Marks: 50**<br>**Internal Assessment Marks: 15 End Term Exam Marks: 35** | | **Time: 3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper-Setter**: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 7short answer questions uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units. Each question will carry 07 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Happiness: Definition and Nature. Sources of Happiness, Factors Affecting Happiness. | 7 |
| II | Culture and Happiness. Eastern and Western Approaches to Happiness. Relationship between Happiness and Money. | 7 |
| III | Happiness as Intrinsic Value. Age and Happiness. Ways to Increase Happiness. | 7 |
| IV | Measuring Happiness: Key Indicators. Happiness Index. Happiness in India. | 7 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: **04 Marks**<br>• Seminar/presentation/assignment/quiz/class test etc.: **04 Marks**<br>• Mid-Term Exam: **7 Marks** | | **End Term Examination:**<br>**35 Marks** |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>Seligman, M. (2002). Authentic Happiness: Using the New Positive Psychology to Realize Your Potential for Lasting Fulfillment. New York: Free Press.<br>Selin, H. and Davey, G. (2012). Happiness Across Cultures. Springer.<br>H H Lama, D. and Cutler, H. C. (2009). The Art of Happiness: A Handbook of Living (10th Anniversary Edition). New York: Riverhead Books.<br>Clark, A. E., Fleche, S., Layard, R., Powdthavee, N. and Ward, G. (2019). The Origins of Happiness. NJ: Princeton University Press.<br>Yew – Kwang Ng (2022). Happiness- Concept, Measurement and Promotion. Springer | | |

**KURUKSHETRA UNIVERSITY**
**Undergraduate Programs (Psychology) Syllabus, Semester –IV**

**VAC-4**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Psychology | | |
| Semester | IV | | |
| Name of the Course | Social and Emotional Learning | | |
| Course Code | B23-VAC-411 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | VAC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | - | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. get awareness regarding social and emotional learning alongwith its historical influences and critical areas.<br>2. understand the role of emotional intelligence in SEL and familiarity with roots of empathy..<br>3. develop insight into measurement of SEL alongwith its current challenges.<br>4. know about evidences in support of SEL and build sustainable framework on the basis of SEL. | | |
| Credits | Theory | Practical | Total |
| | 2 | NA | 2 |
| Contact Hours | 2 | NA | 2 |
| **Max. Marks: 50**<br>**Internal Assessment Marks: 15**<br>**End Term Exam Marks: 35** | | **Time: 3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper-Setter**: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 7short answer questions uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units. Each question will carry 07 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Social and Emotional Learning: Nature, Historical Influences and Critical Areas of Competence. | 7 |
| II | Role of Emotional Intelligence in Social and Emotional Learning. Emotional Intelligence as Social Art.<br>Roots of Empathy. | 7 |
| III | Measurement of Social and Emotional Learning: Tools and Checklists. Current Challenges. | 7 |
| IV | Evidences in Support of Social and Emotional Learning, SEL as a Sustainable Framework for success. | 7 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: **04 Marks**<br>• Seminar/presentation/assignment/quiz/class test etc.: **04 Marks**<br>• Mid-Term Exam: **7 Marks** | | **End Term Examination:**<br>**35 Marks** |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>Black, D. L. (2022). Essentials of Social and Emotional Learning (SEL). NJ: Wiley.<br>Goleman, D. (2005). Emotional Intelligence. USA: Bantam **.** | | |

**KURUKSHETRA UNIVERSITY**
**Undergraduate Programs (Psychology) Syllabus, Semester –IV**

**VAC-4**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Psychology | | |
| Semester | IV | | |
| Name of the Course | SCIENCE OF HAPPINESS AND WELLBEING* | | |
| Course Code | B23-VAC-424 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | VAC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | - | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. get awareness regarding nature, perspectives and measurement of happiness.<br>2. understand happiness in daily life and its expression<br>3. develop insight into practices of happiness and ways to increase happiness.<br>4. understand wellbeing and its relationship with happiness. | | |
| Credits | Theory | Practical | Total |
| | 2 | NA | 2 |
| Contact Hours | 2 | NA | 2 |
| **Max. Marks: 50**<br>**Internal Assessment Marks: 15 End Term Exam Marks: 35** | | **Time: 3 Hours** | |
| ***Kurukshetra University Campus Only.** | | | |

**Part B- Contents of the Course**

**Instructions for Paper-Setter**: The question paper will consist of NINE questions out of which the candidate would be required to attempt FIVE questions. The first question will be compulsory and will have 7short answer questions uniformly spread over entire syllabus. The remaining EIGHT questions will be set taking TWO questions from each of the four units. Each question will carry 07 marks. The candidate would be required to attempt ONE question from each unit in addition to compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Happiness: Concept and Nature, Perspectives of Happiness Brain-Behavior Relationship in Happiness. Measuring Happiness. | 7 |
| II | Happiness in Daily Living: Importance of Empathy, Gratitude and Kindness- Expression of Happiness: Body Language and Non-verbal Cues. | 7 |
| III | Practice of Happiness: Mindfulness, Self-awareness and Self-motivation. Relationship between Creativity and Happiness. | 7 |
| IV | Wellbeing: Nature and Determinants of Wellbeing. Relationship between Happiness and Wellbeing. Building Resilience. | 7 |

**Suggested Evaluation Methods**

| Internal Assessment: | End Term Examination: |
|---|---|
| ➢ **Theory**<br>• Class Participation: **04 Marks**<br>• Seminar/presentation/assignment/quiz/class test etc.: **04 Marks**<br>• Mid-Term Exam: **7 Marks** | **35 Marks** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- The how of happiness by Sonja Lyubomirsky
- Stumbling on happiness by Daniel Gilbert
- Flourish by Mattin P. Seligman
- Thinking Fast and Slow by Daniel Kahneman
- Posiive Psychology: The science of Happiness and Human strengths – Alam carr

- From mindfulness side:
- The bell of mindfulness- the Nhat Hanh
- The art of happiness: A handbook for living- Dalai Lama
- What makes you not a Buddhist- Dzongsar Khense Rinpoche
- Happiness: Transforming the landscape: Centre for Butan Studies, Bhutan (can be

downloaded online)

- A compass towards just and harmonious society- Centre for Bhutan Studies
- (Can be downloaded online)
- New Development Paradigm- Bhutan government submission to the UNGA (can be downloaded online)
- Laugh your way to happiness- Lesley Lyle
- GNH of Business- Centre for Bhutan Studies & GNH
- Tashi: A GNH Journey- Saamdu Chetri (Amazon)
- The future of humanity- Michio Kaku
- Buddha Body Buddha Mind- Thich Nhat Hanh
- Seven Effective Habits-Stefan F Covey
- The miracles of mindfulness: An introduction to meditation- Thich Nhat Hanh
- Love letter to the earth- Thich Nhat Hanh

# KURUKSHETRA UNIVERSITY
# KURUKSHETRA

*(Established by the State Legislature Act XII of 1956)*
*("A+" Grade NAAC Accredited)*

**Scheme of Examination and Syllabus for**

**Undergraduate Programme**

**Subject: PHYSICS**

**Under Multiple Entry-Exit, Internships and**

**CBCS-LOCF in accordance to NEP 2020**

**w.e.f. 2023-24 (in phased manner)**

**Kurukshetra University Kurukshetra**
**Undergraduate Programs**
**Course: MDC-1**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Physics | | |
| Semester | 1st | | |
| Name of the Course | Physics Fundamentals –I | | |
| Course Code | B23-PHY-104 | | |
| Course Type: (CC/MCC/MDC/CC-M/ DSEC /VOC/DSE/PC/AEC/VAC) | MDC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | Not studied Physics subject at level 4 (i.e. 10+2 or equivalent) | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Have knowledge about the nature, scope and impact of physics on technological development of the society.<br>2. Understand and describe motion of an object in one dimension.<br>3. Understand and describe the laws of motion and their applications in daily life.<br>4. Understand and appreciate the importance of work, power and energy in daily life.<br>5. Learn to present observations, results, analysis and different concepts related to experiments of Physics Fundamentals –I | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |
| **Max. Marks:75**<br>**Internal Assessment Marks:20**<br>**End Term Exam Marks: 55** | | **Time:3hrs** | |
| **Part B- Contents of the Course** | | | |

**Instructions for Paper- Setter**

**1.**Nine questions will be set in total.

**2.** Question no. 1 will be compulsory and based on the conceptual aspects of the entire syllabus. This question may have 4 parts and the answer should be in brief but not in Yes/No.

**3.** Four more questions are to be attempted, selecting one question out of two questions set from each unit. Each question may contain two or more parts. All questions will carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Physics - Nature, scope and excitement, major discoveries in Physics, major contribution by Indian Physicists, Physics in relation to other sciences, impact of physics on society and on latest development in science and technology.<br>Units and Dimensions – Physical quantities – fundamental (mass, length and time) and derived. Need of measurement, fundamental and derived units, measuring process. | 8 |
| II | Scalar and Vector quantities with definition, representation and examples, unit vectors, position vector, co-initial vector, collinear vector and co-planar vector. Scalar and vector product (no derivation).<br>Motion of objects in one, two and three dimensions with examples, concept of position, distance, displacement, speed, velocity, average and instantaneous speed, average and instantaneous velocity and acceleration, uniform and non-uniform motion. | 7 |
| III | Causes of motion- concept of force, Newton's laws of motion, daily life applications of Newton's laws of motion, inertia, linear momentum and their significance. Force of friction with daily life examples, Impulse with examples.<br>Circular and rotational motion with examples. Idea of angular displacement, angular velocity, angular acceleration, frequency, time-period, torque, angular momentum, moment of inertia and is physical significance. | 8 |
| IV | Work, Power and Energy – Work - definition, symbol, formula, units and type of work (zero, positive, negative) with examples.<br>Energy - definition, symbol, formula, units, examples, types of mechanical energy, kinetic energy - definition, symbol and formula, potential energy - definition, symbol and formula, daily life examples demonstrating importance of energy, potential energy of an object at a height.<br>Power – definition, formula and units, daily life examples. | 7 |
| | **Practicum**<br>1. To measure the diameter of a small spherical / cylindrical body.<br>2. To measure the length, width and height of the given rectangular block.<br>3. To measure the internal diameter and depth of a given beaker/calorimeter and hence find its volume.<br>4. Use of screw gauge:(i) to measure diameter of a given wire and (ii) to | 30 |

| | | |
|---|---|---|
| | measure thickness of a given sheet<br>5. To determine radius of curvature of a given spherical surface by a spherometer.<br>6. To find the weight of a given body using parallelogram law of vectors.<br>7. Verification of Archimedes principle.<br>8. Verification of Work-energy theorem.<br>9. Acceleration due to gravity (g) by bar pendulum.<br>10. To determine the moment of Inertia of a fly-wheel.<br>11. Study of law of conservation of linear momentum and Kinetic Energy.<br><br>**Note: Student will perform at least six experiments. The examiner will allot one practical at the time of end term examination.** | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory (15 Marks)**<br>• Class Participation: **04 Marks**<br>• Seminar/presentation/assignment/quiz/class test etc.: **04 Marks**<br>• Mid-Term Exam: **7 Marks**<br><br>➢ **Practicum (5 Marks)**<br>• Class Participation: **Nil**<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **5 Marks**<br>• Mid-Term Exam: **Nil** | **End Term Examination : 35 Marks**<br><br>**: 20 Marks** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. Essential University Physics, Vol.-1 &2 by Richard Wolfson, Pearson Education, Patparganj, Delhi, India.
2. Concept of Physics by H.C. Verma, Bharti Bhawan, Ansari Road, Daryaganj, New Delhi, India.
3. Modern Physics (2nd edition), by S.L. Kakani and Shubhra Kakani, Viva Books, New Delhi.
4. Physics for Scientists and Engineers with Modern Physics, 7th edition, by Raymond A. Serway and John W. Jewett, Jr., Thomson Higher Education 10 Davis Drive Belmont, CA 94002-3098 USA.
5. Physics For You, Fifth Edition, by Keith Johnson, OUP Oxford; 5th edition (23 June 2016).
6. B.Sc Practical Physics, C. L. Arora, R Chand & Co. New Delhi
7. B.Sc Practical Physics, Harnam Singh and Dr. P.S. Hemne, S Chand & Company Ltd.

**Kurukshetra University Kurukshetra**
**Undergraduate Programs**
**Course: MDC-2**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Physics | | |
| Semester | 2nd | | |
| Name of the Course | **Physics Fundamentals-II** | | |
| Course Code | B23-PHY-204 | | |
| Course Type: (CC/MCC/MDC/CC-M/ DSEC /VOC/DSE/PC/AEC/VAC) | MDC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | Not studied Physics subject at level 4 (i.e. 10+2 or equivalent) | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Have basic knowledge about Wave motion, SHM, the associated phenomena and their applications in daily life<br>2. Have basic knowledge about nature of light, the associated phenomena and their importance in daily life<br>3. Have basic knowledge about electric current, electric circuit, electric components, and practical utility of heating and magnetic effects of electric current<br>4. Grasp an introductory idea about the Electric components and circuits<br>5. Understand the observations, results, analysis and different concepts related to experiments of light & optics. | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |
| **Max. Marks:75**<br>**Internal Assessment Marks:20**<br>**End Term Exam Marks: 55** | | **Time:3hrs** | |

| | |
|---|---|
| | |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

**1.**Nine questions will be set in total.

**2.** Question no. 1 will be compulsory and based on the conceptual aspects of the entire syllabus. This question may have 4 parts and the answer should be in brief but not in Yes/No.

**3.** Four more questions are to be attempted, selecting one question out of two questions set from each unit. Each question may contain two or more parts. All questions will carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Wave motion and applications – Waves - definition, types (mechanical and electromagnetic wave), Wave motion - transverse and longitudinal with examples, terms used in wave motion like displacement, amplitude, time period, frequency, wavelength, wave velocity; relationship among wave velocity, frequency and wave length.<br>Simple harmonic motion (SHM): definition, examples, free, forced and resonant vibrations with examples. | 8 |
| II | Light and ray optics – Definition, nature, speed and properties of light, reflection and refraction of light, laws of reflection and refraction, examples and applications in daily life, reflection through mirrors (plane, convex and concave) and refraction through lenses (concave and convex), refractive index, refraction of light through prism (dispersion of light), rainbow formation, twinkling of stars, advance sunrise and delayed sunset. | 7 |
| III | Electricity - electric charge, types of charges, unit of charge, frictional electricity, Coulomb's law of electrostatics, electric field, electric lines of force, electric field intensity (definition and properties), electric flux, Gauss's law (statement and formula only), electric current, units of electric current, direct and alternating current, measurement of current, resistance, resistivity and Ohm's law, electric potential, potential difference and emf. | 8 |
| IV | Electric components and circuits - resistor, capacitor, electric cell, ammeter, voltmeter, galvanometer, keys and variable resistors. Series and parallel combinations of resistors, domestic electrical wiring and electrical safety (fuse, hot wire, neutral, ground and short circuit), electric power and electric power transmission; Heating effect of current and its practical applications. | 7 |
| | **Practicum**<br>1. To find the focal length of a convex mirror using a convex lens.<br>2. To find the value of v for different values of u in the case of a concave mirror and to find the focal length<br>3. To find the focal length of a concave lens using a convex lens.<br>4. To determine the refractive index of a glass slab<br>5. To find the refractive index of a liquid using a convex lens and plane | 30 |

| | | |
|---|---|---|
| | mirror<br>6. To determine the resistivity of different wires by plotting a graph for potential difference versus current.<br>7. To verify Ohm's law for metallic conductor and to determine its resistance.<br>8. To find the frequency of AC mains with a sonometer.<br>9. Use of Multimeter for measuring Resistance, A.C. and D.C. Voltage and Current, checking of electrical fuses.<br>10. Use of Multimeter to check the working condition of diode, an LED, a resistor and a capacitor.<br>**Note: Student will perform at least six experiments. The examiner will allot one practical at the time of end term examination.** | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory (15 Marks)**<br>• Class Participation: **04 Marks**<br>• Seminar/presentation/assignment/quiz/class test etc.: **04 Marks**<br>• Mid-Term Exam: **7 Marks**<br>➢ **Practicum (05 Marks)**<br>• Class Participation: **Nil**<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **05 Marks**<br>• Mid-Term Exam: **Nil** | **End Term Examination : 35 Marks**<br><br>**20 Marks** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. Essential University Physics, Vol.-1 &2 by Richard Wolfson, Pearson Education, Patparganj, Delhi, India.
2. Concept of Physics by H.C. Verma, Bharti Bhawan, Ansari Road, Daryaganj, New Delhi, India.
3. Modern Physics (2nd edition), by S.L. Kakani and Shubhra Kakani, Viva Books, New Delhi.
4. Physics for Scientists and Engineers with Modern Physics, 7th edition, by Raymond A. Serway and John W. Jewett, Jr., Thomson Higher Education 10 Davis Drive Belmont, CA 94002-3098 USA.
5. Physics For You (Fifth Edition) by Keith Johnson.
6. B.Sc Practical Physics, C. L. Arora, R Chand & Co. New Delhi
7. B.Sc Practical Physics, Harnam Singh and Dr. P.S. Hemne, S Chand & Company Ltd.

**Kurukshetra University Kurukshetra**
**Undergraduate Programs**
**Course: MDC-3**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Physics | | |
| Semester | 3rd | | |
| Name of the Course | **Elements of modern Physics** | | |
| Course Code | B23-PHY-304 | | |
| Course Type: (CC/MCC/MDC/CC-M/ DSEC /VOC/DSE/PC/AEC/VAC) | MDC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | Not studied Physics subject at level 4 (i.e. 10+2 or equivalent) | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Have introductory idea about the importance of semiconductors and basic semiconductor devices<br>2. Have the knowledge about the importance of magnetic materials<br>3. Understand importance of radioisotopes, Nuclear fission and fusion reactions and their hazardous aspects also<br>4. Have the knowledge about the lasers and optical fibers and their importance in scientific and technological fields<br>5. Learn to present observations, results, analysis and different concepts related to experiments of Elements of modern Physics. | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |
| **Max. Marks:75**<br>**Internal Assessment Marks:20**<br>**End Term Exam Marks: 55** | | **Time:3hrs** | |
| **Part B- Contents of the Course** | | | |

**Instructions for Paper- Setter**

**1.**Nine questions will be set in total.

**2.** Question no. 1 will be compulsory and based on the conceptual aspects of the entire syllabus. This question may have 4 parts and the answer should be in brief but not in Yes/No.

**3.** Four more questions are to be attempted, selecting one question out of two questions set from each unit. Each question may contain two or more parts. All questions will carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Basics of semiconductors - atomic structure, energy levels and energy bands (basic idea), types of materials (conductors, semiconductors and insulators) their energy band diagrams and definition on the basis of energy gap, intrinsic semiconductors, extrinsic semiconductors -p-type and n-type semiconductors (basic idea),<br>Basics of Semiconductor devices - P-N junction diode - depletion layer, forward biasing and reverse biasing, V-I characteristics of PN junction diodes; ideal diode, diode as a switch, Basic idea of a Photodiode, Solar cell and Light emitting diode (LED). | 8 |
| II | Magnetic Materials - Introduction, classification – paramagnetic, diamagnetic and ferromagnetic materials and their applications; Piezoelectricity and applications of Piezoelectric materials; Ceramics and polymers and their applications; Superconductivity, superconductors and their applications; Nanomaterials and their applications. | 7 |
| III | Atomic nucleus – Idea of composition and properties of nucleus (charge, mass, size and density), nucleons, atomic number, mass number, isotopes, isobars and isotones; nuclear binding energy, Radioactive decay - $\alpha$, $\beta$, and $\gamma$-decay; Idea of half-life time and decay constant, carbon dating and its importance, radioisotopes and their applications. Idea of nuclear fission and nuclear fusion. Nuclear reactors, source of solar and stellar energy. | 7 |
| IV | Laser – introduction, absorption, spontaneous emission, stimulated emission, properties of laser light. Principle of laser - Light amplification, population inversion and pumping. Principle and working of Ruby, He-Ne and semiconductor laser (basic idea). Applications of Lasers in healthcare and different fields of science and technology.<br>Basics of Fiber Optics- introduction to optical fibers (definition, principle and parts) light propagation and the optical fibers, types of optical fiber (basic idea), applications of optical fibers in medical, telecommunication and sensors. | 8 |
| | **Practicum**<br>1. V-I characteristics of p-n junction diode.<br>2. V-I characteristics of Zener diode.<br>3. Characteristics of Solar Cell<br>4. To verify the inverse square law of light using a photo-voltaic cell.<br>5. To determine value of Boltzmann constant using V-I characteristic of PN diode.<br>6. To study the effect of intensity of light (by varying distance of the | 30 |

| | | |
|---|---|---|
| | source) on an LDR<br>7. To verify the characteristics of LASER<br>8. To measure the numerical aperture of an optical fibre using He-Ne laser source.<br>9. Study double slit interference by He-Ne laser<br>10. Determine the diameter of a wire using (He-Ne Laser) diffraction method<br><br>**Note: Student will perform at least six experiments. The examiner will allot one practical at the time of end term examination.** | |

| **Suggested Evaluation Methods** | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory (15 Marks)**<br>• Class Participation: **04 Marks**<br>• Seminar/presentation/assignment/quiz/class test etc.: **04 Marks**<br>• Mid-Term Exam: **7 Marks**<br><br>➢ **Practicum (5 Marks)**<br>• Class Participation: **Nil**<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **5 Marks**<br>• Mid-Term Exam: **Nil** | **End Term Examination : 35 Marks**<br><br>**: 20 Marks** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. Concept of Modern Physics by Arthur Beiser, McGraw Hill Education.
2. Modern Physics (2nd edition), by S.L. Kakani and Shubhra Kakani, Viva Books, New Delhi.
3. Semiconductor Devices - Physics and Technology by S.M .Sze ,Wiley (1985)
4. Laser and Non-linear optics by B.B.Laud. ,Wiley Eastern Limited (1985)
5. Semiconductor Electronics by A.K.Sharma ,New Age International Publisher(1996)
6. Kenneth S. Krane, Introductory Nuclear Physics, Wiley, New York, 1988
7. Radiation detection and measurement: G.F. Knoll (Wiley, New York) (2000)
8. Verma and Srivastava : Crystallography for Solid State Physics
9. Rajnikant; Solid State Physics, Willey India, 2011.
10. J.C. Anderson, KD. Leaver, R.D. Rawlings and J.M. Alexander, Materials Science, 4th Edition (ChapmanHall, London, 1990).
11. V. Raghavan, Materials Science and Engineering, 3rd Ed. (Prentice-Hall India, New Delhi, 1993).
12. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
13. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn 4 Edition, reprinted 1985, Heinemann Educational Publishers
14. B.Sc Practical Physics, C. L. Arora, R Chand & Co. New Delhi
15. B.Sc Practical Physics, Harnam Singh and Dr. P.S. Hemne, S Chand & Company Ltd.

# KURUKSHETRA UNIVERSITY
# KURUKSHETRA

*(Established by the State Legislature Act XII of 1956)*
*("A+" Grade NAAC Accredited)*

**Scheme of Examination for SEC (PHYSICS)**

**Under Multiple Entry-Exit, Internships and**

**CBCS-LOCF in accordance to NEP 2020**

**w.e.f. 2023-24 (in phased manner)**

## Kurukshetra University Kurukshetra

**Scheme and Syllabus of Examination for Undergraduate programme**

# Scheme of Examination for SEC (PHYSICS)

Under Multiple Entry-Exit, Internships and
CBCS-LOCF in accordance to NEP 2020
w.e.f. 2023-24 (in phased manner)

| Semester | Course Type | Course Code | Nomenclature of paper | Credits | Contact hours | Internal marks | End term Marks | Total Marks | Duration of exam (Hrs) T + P |
|---|---|---|---|---|---|---|---|---|---|
| 2nd sem | SEC-2 | B23-SEC-227 | Physics Laboratory Skill Enhancement | 2 | 2 | 15 | 35 | 50 | 3 |
| | | | Practicum | 1 | 2 | 5 | 20 | 25 | 3 |
| | | | | | | | | | |
| 3rd sem | SEC-3 | B23-SEC-329 | Basic Instrumentation Skills | 2 | 2 | 15 | 35 | 50 | 3 |
| | | | Practicum | 1 | 2 | 5 | 20 | 25 | 3 |

**Kurukshetra University Kurukshetra**
**Undergraduate Programs**
**Course: SEC-1**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **PartA - Introduction** | | | |
| Subject | Physics | | |
| Semester | 1st | | |
| Name of the Course | Physics Laboratory Skill Enhancement | | |
| Course Code | B23-SEC-227 | | |
| CourseType: (CC/MCC/MDC/CC-M/ DSEC /VOC/DSE/PC/AEC/VAC) | SEC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | NA | | |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Learning measuring devices like Vernier callipers, Screw gauge, spherometer, micro-meter, travelling microscope and Sextant for measuring various length scales.<br>2. Developing mechanical skill such as casting, foundry, machining, forming and welding and will become familiar with common machine tools like lathe, shaper, drilling, milling, surface machines and Cutting tools.<br>3. Acquiring optical skills that will be helpful in healthcare and automobiles.<br>4. Obtain skills in the usage of multi-meters and electric measuring devices, soldering of electrical circuits, oscilloscopes, power supplies and relays..<br>5. Learn to present observations, results, analysis and different concepts related to Physics Laboratory Skill | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |

| | |
|---|---|
| **Max. Marks:75**<br>**Internal Assessment Marks:20**<br>**End Term Exam Marks:55** | **Time:3hrs** |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

**1.**Nine questions will be set in total.

**2.** Question no. 1 will be compulsory and based on the conceptual aspects of the entire syllabus. This question may have 4 parts and the answer should be in brief but not in Yes/No.

**3.** Four more questions are to be attempted, selecting one question out of two questions set from each unit. Each question may contain two or more parts. All questions will carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Units and Dimensions** – Physical quantities – fundamental (mass, length and time) and derived. Need of measurement, fundamental and derived units, system of units, measuring process. SI and CGS system of units, Measuring devices: Vernier calliper, Screw gauge, spherometer, micro-meter, spectrometer and travelling microscope. Measurement of the dimensions of a solid block, volume of a cylindrical beaker/glass, diameter of a thin wire, thickness of metal sheet, etc. Use of Sextant to measure height of buildings, mountains, etc.\ | 7 |
| II | **Mechanical Skills:** Overview of manufacturing methods: casting, foundry, machining, forming and welding. Types of welding joints and welding defects. Concept of machine processing, introduction to common machine tools like lathe, shaper, drilling, milling and surface machines. Cutting tools, lubricating oils. Common materials used for manufacturing like steel, copper, iron, metal sheets, composites and alloy and wood. | 8 |
| III | **Optical Skills:** Optical devices – mirrors, lenses, prism, grating, telescope, microscope and polarimeter, their theory viz. focal length, refractive index, dispersive power and resolving power etc., applications of optical devices in automobiles and healthcare, basics of an optical camera. | 7 |
| IV | **Electrical and Electronic Skills:** Idea of passive electrical components - resistor, capacitor and inductor and active electronic components – diode, transistor and ICs, Use of ammeter, voltmeter, galvanometer and multi-meter. Soldering of electrical circuits having discrete components R, L, C, diode, transistor and ICs on PCB. Operation of cathode ray oscilloscope. Making regulated power supply. Timer circuit, electronic switch using transistor and relay. | 8 |
| | **Practicum**<br>1. Comparison of diameter of a thin wire using screw gauge and travelling microscope.<br>2. To find the height/area of a distant object using sextant.<br>3. To find radius of curvature of a curved surface.<br>4. To identify various parts of a spectrometer. | 30 |

| | | |
|---|---|---|
| | 5. To find the least count of a spectrometer.<br>6. Drilling of hole in metal, wood and plastic.<br>7. Cutting of metal sheets.<br>8. Cutting of glass sheets.<br>9. To find the power of a concave/convex mirror.<br>10. To find the power of a concave/convex lens.<br>11. To find the resolving power of a telescope.<br>12. To study the V-I characteristic of a resistor.<br>13. To study V-I characteristic of a diode.<br>14. To study a regulated power supply.<br><br>**Note: Student will perform at least six experiments. The examiner will allot one practical at the time of end term examination.** | |
| **SuggestedEvaluationMethods** | | |
| **InternalAssessment:**<br>➢ **Theory (15 Marks)**<br>• Class Participation: **04 Marks**<br>• Seminar/presentation/assignment/quiz/class test etc.: **04 Marks**<br>• Mid-Term Exam: **7 Marks**<br><br>➢ **Practicum (5 Marks)**<br>• Class Participation: **Nil**<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **5 Marks**<br>• Mid-Term Exam: **Nil** | | **End Term Examination : 35 Marks**<br><br>**: 20 Marks** |
| **PartC-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br><br>**1.** A text book in Electrical Technology - B L Theraja, S. Chand and Company.<br>**2.** Performance and design of AC machines M.G. Say, ELBS Edn.<br>**3.** Mechanical workshop practice, K.C. John, 2010, PHI Learning Pvt. Ltd.<br>**4.** Optical Physics, A. Lipson, S.G. Lipson, H. Lipson, 4th Edn., 1996, Cambridge Univ. Press<br>**5.** Workshop Processes, Practices and Materials, Bruce J Black 2005, 3rd Edn., Editor Newnes [ISBN: 0750660732]<br>**6.** New Engineering Technology, Lawrence Smyth/Liam Hennessy, The Educational Company of Ireland [ISBN0861674480]. | | |

**Kurukshetra University Kurukshetra**
**Undergraduate Programs**
**Course: SEC-3**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **PartA - Introduction** | | | |
| Subject | Physics | | |
| Semester | 2nd | | |
| Name of the Course | **Basic Instrumentation Skills** | | |
| Course Code | B23-SEC-329 | | |
| CourseType: (CC/MCC/MDC/CC-M/ DSEC /VOC/DSE/PC/AEC/VAC) | SEC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | NA | | |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Understand the necessary working knowledge on accuracy, precision, resolution, range and errors/uncertainty in measurements.<br>2. Explanation of the specifications of CRO and their significance.<br>3. Understandthe Signal and pulse Generators and impedance Bridges.<br>4. Learn about the basics of digital instruments.<br>5. Understand the observations, results, analysis and different concepts related to basic instruments. | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |
| **Max. Marks:75**<br>**Internal Assessment Marks:20**<br>**End Term Exam Marks:55** | | **Time:3hrs** | |

| | |
|---|---|
| | |

**Part B-Contents of the Course**

**Instructions for Paper- Setter**

**1.**Nine questions will be set in total.

**2.** Question no. 1 will be compulsory and based on the conceptual aspects of the entire syllabus. This question may have 4 parts and the answer should be in brief but not in Yes/No.

**3.** Four more questions are to be attempted, selecting one question out of two questions set from each unit. Each question may contain two or more parts. All questions will carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Basic of Measurements**: Instruments accuracy, precision, sensitivity, resolution range, etc. Errors in measurements and loading effects. Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.<br>**Electronic Voltmeter**: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principle of voltage measurement (block diagram only). Specifications of an electronic Voltmeter and their significance. AC millivoltmeter: Types of AC millivoltmeters. Block diagram of ac millivoltmeter, specifications and their significance. | 8 |
| II | **Oscilloscope**: Block diagram of basic CRO. CRT, electrostatic focusing and acceleration (Explanation only no mathematical treatment), brief discussion on screen phosphor, visual persistence. Time base operation, synchronization. Front panel controls. Specifications of CRO and their significance.<br>**Use of CRO:** for the measurement of voltage (dc and ac) and frequency and time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digitalstorage Oscilloscope: principle of working | 9 |
| III | **Signal and pulse Generators:** Block diagram, explanation and specifications of low frequency signal generator and pulse generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.<br>**Impedance Bridges:** Block diagram of bridge. working principles of basic (balancing type) RLC bridge. Specifications of RLC bridge. Block diagram and working principles of a Q- Meter. Digital LCR bridges. | 7 |
| IV | **Digital Instruments:** Comparison of analog & digital instruments. Characteristics of a digital meter. Working principle of digital voltmeter.<br>**Digital Multimeter:** Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution. | 6 |

| | | |
|---|---|---|
| | **<u>Practicum</u>**<br>1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.<br>2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.<br>3. To measure Q of a coil and its dependence on frequency, using a Q- meter.<br>4. Measurement of voltage, frequency, time period and phase difference using Oscilloscope.<br>5. Measurement of time period, frequency, average period using universal counter/frequency counter.<br>6. Measurement of rise, fall and delay times using an Oscilloscope.<br>7. Measurement of distortion of a RF signal generator using distortion factor meter.<br>8. Measurement of R, L and C using a LCR bridge/ universal bridge<br>**Note: Student will perform at least six experiments. The examiner will allot one practical at the time of end term examination.** | 30 |

**SuggestedEvaluationMethods**

| | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory (15 Marks)**<br>• Class Participation: **04 Marks**<br>• Seminar/presentation/assignment/quiz/class test etc.: **04 Marks**<br>• Mid-Term Exam: **7 Marks**<br>➢ **Practicum (05 Marks)**<br>• Class Participation: **Nil**<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **05 Marks**<br>• Mid-Term Exam: **Nil** | **End Term Examination : 35 Marks**<br><br>**20 Marks** |

**PartC-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. Logic circuit design, Shimon P. Vingron, 2012, Springer.
2. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
3. Electronic Devices and circuits, S. Salivahanan& N. S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill.
4. Digital Circuits and Systems, Venugopal, 2011, Tata McGraw Hill.
5. Electronic Instrumentation, H.S. Kalsi, 3rd Ed. Tata McGraw Hill.
6. A text book in Electrical Technology - B L Theraja - S Chand and Co.
7. Performance and design of AC machines - M G Say ELBS Edn.

# Kurukshetra University, Kurukshetra

## Scheme of Examination UG Programme (Interdisciplinary): Scheme D

## Subject: Bachelor of Physical Education, Health Education and Sports Science

**as per NEP 2020 Curriculum Framework for Undergraduate Programme (Multiple Entry-Exit, Internships and Choice Based Credit System implemented form session 2023-24.**

| SEMESTER | Type of Course | COURSE CODE | PAPER/TITLE | CREDITS | | | Contact Hours (T+P) | Max. Marks | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Theory | Practical | Total | | Theory | | Practical | | Total |
| | | | | | | | | External | Internal | External | Internal | |
| 1 | Core Course - 1 | 23-BPE-101 | History and Foundation of Physical Education | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Core Course - 2 | 23-BPE-102 | Heath Education | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Core Course - 3 | 23-BPE-103 | Basic Anatomy and Physiology | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Core Course Minor - 1 | 23-BPE-104 | Olympics Movement | 2 | 0 | 2 | 2 | 35 | 15 | - | - | 50 |
| | Multidisciplinary Courses (MDC) - 1 | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |
| | Ability Enhancement Courses (AEC) - I | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |
| | Skill Enhancement Courses (SEC) - I | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |
| | Value Added Course – 1 | B-23- VAC-101 | Human Values and Ethics | 2 | 0 | 2 | 2 | 35 | 15 | - | - | 50 |
| 2 | Core Course - 4 | 23-BPE-201 | Exercise Physiology | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Core Course - 5 | 23-BPE-202 | Fundamentals of Sports Medicine | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Core Course - 6 | 23-BPE-203 | Officiating and Coaching | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Core Course Minor - 2 | 23-BPE-204 | Asian and Commonwealth Games | 2 | 0 | 2 | 2 | 35 | 15 | - | - | 50 |
| | Multidisciplinary Courses (MDC) - 2 | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |
| | Ability Enhancement Courses (AEC) - 2 | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |
| | Skill Enhancement Courses (SEC) - 2 | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |
| | Value Added Course - 2 | B-23- VAC-201 | Environment Studies | 2 | 0 | 2 | 2 | 35 | 15 | - | - | 50 |
| Internship of 4 credits of 4-6 weeks duration after 2nd semester | | | | | | | | | | | | |
| 3 | Core Course - 7 | 23-BPE-301 | Sports Psychology | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Core Course - 8 | 23-BPE-302 | Sports Nutrition | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Core Course - 9 | 23-BPE-303 | Fundamentals of Sports Training | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Core Course Minor - 3 | 23-BPE-304 | Athletics – Track Events and Field Events | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Multidisciplinary Courses (MDC) - 3 | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |
| | Ability Enhancement Courses (AEC) - 3 | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |
| | Skill Enhancement Courses (SEC) - 3 | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |
| 4 | Core Course - 10 | 23-BPE-401 | Physical Fitness and wellness | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Core Course - 11 | 23-BPE-402 | Sports Sociology | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Core Course - 12 | 23-BPE-403 | Organization and Administration | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | Core Course Minor - 4 (V) | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |
| | Ability Enhancement Courses (AEC) - 4 | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |
| | Value Added | Course from Pool of Courses Available in College/Institute | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Course - 3** | | | | | | | | | | | |
| **Internship of 4 credits of 4-6 weeks duration after 4th semester** | | | | | | | | | | | | |
| **5** | **Core Course - 13** | **23-BPE-501** | **Sports Journalism** | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | **Core Course - 14** | **23-BPE-502** | **Kinesiology** | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | **Core Course - 15** | **23-BPE-503** | **Sports Management** | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | **Core Course Minor- 5 (V)** | **23-BPE-504** | **Stress Management** | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | **Internship of 4 Credits** | | | | | | | | | | | |
| **6** | **Core Course - 16** | **23-BPE-601** | **Test, Measurement & Evaluation in Physical Education** | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | **Core Course - 17** | **23-BPE-602** | **Biomechanics** | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | **Core Course - 18** | **23-BPE-603** | **Curriculum Design in Physical Education** | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | **Core Course Minor- 6** | **23-BPE-604** | **Posture and Athletic Care** | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |
| | **Core Course Minor- 7** | **23-BPE-605** | **Adapted Physical Education** | 3 | 1 | 4 | 5 (3+2) | 50 | 20 | 20 | 10 | 100 |

**2nd Semester (Bachelor of Physical Education, Health Education and Sports Science)**
**(According to NEP2020 from Session 2023 - 24)**

# Core Course - 4

| Part A - Introduction | | | |
|---|---|---|---|
| Subject: | **Physical Education, Health Education and Sports Science** | | |
| Semester | **2nd Semester** | | |
| Name of the Course | **Exercise Physiology** | | |
| Course Code | **23-BPE-201** | | |
| Course Type: | **Core Course - 4** | | |
| Level of the Course | **100-199** | | |
| Pre-requisite (if any) | | | |
| Course Learning Outcomes (CLOs): | **After completing this course, the learner will be able to:**<br>1. Describe the meaning and origins of Exercise Physiology, Concept o Energy Production during rest and exercise.<br>2. Explain the Macro & Micro Structure, Chemical Composition and effect of exercise on Skeletal Muscle.<br>3. Illustrate the Conduction System of heart and effect of exercise on Circulatory system<br>4. Tell the Mechanics of Breathing during rest and exercise. Explain the Nervous control of Respiration and effect of exercise on the respiratory system | | |
| | 5. Know the basic techniques of measuring Pulse Rate, Blood Pressure, Peak Expiratory flow in 1 sec. and Ventilation Capacity. Able to evaluate the Vo2 max. and do basic interpretation of ECG. | | |
| **Credits** | **Theory** | **Practical** | **Total** |
| | 3 | 1 | 4 |
| Contact Hours | 3 hours per week | 2 hours per week<br>(Size of practical group = 20 students) | 5 |
| **Max. Marks: 100**<br>**Part I - Theory = 70**<br>**(Internal Assessment - 20 Marks + End Term Exam – 50 Marks)**<br>**Part II - Practical = 30**<br>**(Internal Assessment - 10 Marks + End Term Exam – 20 Marks)** | | Time: 3 Hours<br>**For End Term Exam** | |

**Part B- Content of the Course**

**Instructions for Paper- Setter:**

The question paper will consist of Five Units I, II, III, IV and V. Units I, II, III & IV will have two questions from their respective Units of the Syllabus and will carry 10 marks each. Unit Vth will consist of 5 short answer type questions, which will cover the entire syllabus and will carry 2 marks for each question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Introduction of Exercise Physiology and Energy Production**<br>• Meaning, Definition and Origins of Exercise Physiology<br>• Scope and Importance of Exercise Physiology in Physical Education and Sports<br>• Meaning of Anabolism, Catabolism and Metabolism<br>• ATP – PC or Phosphate system, Anaerobic metabolism, Aerobic, Metabolism,<br>• Aerobic and Anaerobic energy Systems during Rest and Exercise. | 11 |

| | | |
|---|---|---|
| II | **Exercise and Muscular System**<br>• Macro & Micro Structure of Skeletal Muscle<br>• Chemical Composition of Skeletal Muscle.<br>• Types and Characteristic of muscle fiber.<br>• Meaning of Motor Unit, Muscle Hypertrophy and Atrophy, Muscle Tone, Lactate threshold and Muscle Fatigue.<br>• Effects of exercise on muscular system. | 12 |
| III | **Exercise and Circulatory System**<br>• Conduction System of the Heart<br>• Blood Supply to the Heart, Cardiac Cycle<br>• Meaning of Stroke Volume, Cardiac Output, Heart Rate, Blood Pressure, Cardiac Reserve Capacity, Bradycardia, Tachycardia<br>• Factors Affecting Heart Rate<br>• Effect of exercises and training on the Circulatory system. | 12 |
| IV | **Exercise and Respiratory System**<br>• Mechanics of Breathing during rest and exercise<br>• Nervous control of Respiration<br>• Role Various Respiratory muscles in Breathing<br>• Meaning of Total Lungs Capacity, Ventilation Capacity, Inspiration Reserve Capacity, Expiration Reserve Capacity, Tidal Volume, Residual Volume and Volumes, Oxygen debt, $VO_2$ Max.<br>• Effect of exercises and training on the respiratory system. | 11 |

**Suggested Evaluation Methods:**

**Maximum Marks: 70 (Internal Assessment - 20 Marks + End Term Exam – 50 Marks)**

| **Internal Assessment: 20 Marks** | **End Term Exam: 50 Marks** **Time = 3 hrs** |
|---|---|
| Continuous Comprehensive Evaluation (CCE): 20 Marks<br>Class presentation = 5<br>Seminar/ Assignment/Quiz/class test, etc. = 5<br>Mid Term Test = 10 | One question of 10 marks from each Units I to IV = 40 Marks.<br>Five Questions short answer from entire syllabus = 5 × 2 Marks = 10 Marks. |

**Part II – Practical**
**(Internal Assessment - 10 Marks + External – 20 Marks)**

| Unit | Topics | Marks distribution | Contact Hours |
|---|---|---|---|
| I | 1. Techniques of Measuring Blood Lactate level before and after exercise.<br>2. Technique of Measuring Ventilation Capacity. | 15 Marks | 15 |
| II | 1. Technique of calculation Vo2 Max.<br>2. Basic Interpretation of ECG. | 15 Marks | 15 |
| | **Internal Assessment: 10 Marks**<br>Evaluation through Skill Test/ Assignments/ Quiz/ Viva Voce/ Practical Record File<br>(5 Marks for Each) | **End Term Exam: 20 Marks**<br>Evaluation through performance in Skill Test/ Demonstration/ Viva Voce/ Practical Record File (10 Marks for Each) | |

## Part C-Learning Resources

**Suggested Readings:**


- Amrit K. & Moses, R. (2007). Introduction to Exercise Physiology Poompugar Pathipagam, Madras.
- Clarke, D.H. (2001). Exercise Physiology. New Jersey Prentice Hall Inc., Englewood Cliffs.
- David, L Costill. (2010). Physiology of Sports and Exercise. USA: Human Kinetics.

- Christine, M. D., (1999). Physiology of sports and exercise. USA: Human Kinetics.
- Conley, M. (2000). Bioenergetics of exercise training. USA: Human Kinetics.
- Fox, E.L. (2015). The Physiological Basis of Physical Education and Athletics. Philadelphia: Sanders College Publishing.
- Hunter, M. D. (1979). A dictionary for physical educators. In H. M. Borrow & R. McGee, (Eds.), A Practical approach to measurement in Physical Education Philadelphia: Lea & Febiger.
- Vincent, T. Murche. (2008). Elementary Physiology Hyderabad: Sports Publication
- Khanna, G.L., (1990). Exercise physiology & sports medicine. Delhi:Lucky Enterprises.
- Mathew, D.K. & Fox, E.L, (1971). Physiological basis of physical education and athletics. Philadelphia:W.B. Saunders Co.
- Pandey, P.K., (1987). Outline of sports medicine, New Delhi: J.P. Brothers Pub.
- Williams, J. G. P. (1962). Sports medicine. London: Edward Arnold Ltd.

**2nd Semester (Bachelor of Physical Education, Health Education and Sports Science)**
**(According to NEP2020 from Session 2023 - 24)**

# Core Course - 5

| Part A - Introduction | | | |
|---|---|---|---|
| Subject: | **Physical Education, Health Education and Sports Science** | | |
| Semester | **2nd Semester** | | |
| Name of the Course | **Fundamentals of Sports Medicine** | | |
| Course Code | **23-BPE-202** | | |
| Course Type: | **Core Course - 5** | | |
| Level of the Course | **100-199** | | |
| Pre-requisite (if any) | | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Describe the Aims, Objectives, scope and Principles of Sports Medicine and First Aid<br>2. Explain the Classification, symptoms and treatment of Common sports injuries.<br>3. Illustrate the Guiding principles, Scope, Techniques and Benefits of physiotherapy<br>4. Tell the Scope, Classification, Principles and Physiological Effects of Therapeutic Exercise | | |
| | 5. Know the basic techniques of Bandages, CPR, Electrotherapy, Infrared rays, Ultraviolet rays, short wave diathermy. | | |
| **Credits** | **Theory** | **Practical** | **Total** |
| | 3 | 1 | 4 |
| Contact Hours | 3 hours per week | 2 hours per week<br>(Size of practical group = 20 students) | 5 |
| **Max. Marks: 100**<br>**Part I - Theory = 70**<br>**(Internal Assessment - 20 Marks + End Term Exam – 50 Marks)**<br>**Part II - Practical = 30**<br>**(Internal Assessment - 10 Marks + End Term Exam – 20 Marks)** | | Time: 3 Hours<br>**For End Term Exam** | |

**Part B- Content of the Course**

**Instructions for Paper- Setter:**

The question paper will consist of Five Units I, II, III, IV and V. Units I, II, III & IV will have two questions from their respective Units of the Syllabus and will carry 10 marks each. Unit Vth will consist of 5 short answer type questions, which will cover the entire syllabus and will carry 2 marks for each question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Introduction of Sports Medicine**<br>• Sports Medicine: Meaning, Aims, Objectives, Modern Concepts and Importance.<br>• Brief history of Sports Medicine in India and Aboard<br>• Qualifications of Sports Medicines Personals, Career opportunities in Sports Medicine<br>• Meaning, Aims, Objectives and Principles of First Aid<br>• First Aid for Burning, Electric shock, Snake Bite, Fracture, Drowning, Bleeding and Choking | 11 |

| | | |
|---|---|---|
| II | **Sports Injuries:**<br>• Ways and methods for the prevention of injuries in sports<br>• Meaning of Acute and Chronic Sports injuries<br>• Classification of Sports injuries, their symptoms and treatment for sports injuries of Skin, Bone, Ligaments, Muscles, Joints and Nerves.<br>• Massage: Meaning and Types of Massages, Brief History of Massage<br>• Physiological Effects of Massage. | 12 |
| III | **Introduction of Physiotherapy**<br>• Meaning and Definition of Physiotherapy and Rehabilitation<br>• Guiding principles, Scope and Benefits of physiotherapy<br>• Technique and Physiological Effect of Electrotherapy, infrared rays, Ultraviolet rays, short wave diathermy and Ultrasonic rays.<br>• Technique and Physiological Effect of Steam Bath, Sauna Bath and Hot Water Fomentation | 12 |
| IV | **Therapeutic Exercise:**<br>• Meaning and definition of Therapeutic Exercise<br>• Scope and Principles of Therapeutic Exercise<br>• Therapeutic exercise: Classification and Physiological Effects<br>• Meaning and Types of Free Mobility Exercise<br>• Therapeutic Exercises for Shoulder, Elbow, Wrist and Finger Joints, Hips, Knee, Ankle and Foot joints, Trunk, Head and Neck. | 11 |

**Suggested Evaluation Methods:**
**Maximum Marks: 70 (Internal Assessment - 20 Marks + End Term Exam – 50 Marks)**

| | |
|---|---|
| **Internal Assessment: 20 Marks**<br>Continuous Comprehensive Evaluation (CCE): 20 Marks<br>Class presentation = 5<br>Seminar/ Assignment/Quiz/class test, etc. = 5<br>Mid Term Test = 10 | **End Term Exam: 50 Marks** **Time = 3 hrs**<br>One question of 10 marks from each Units I to IV = 40 Marks.<br>Five Questions short answer from entire syllabus = 5 × 2 Marks = 10 Marks. |

**Part II – Practical**
**(Internal Assessment - 10 Marks + External – 20 Marks)**

| Unit | Topics | Marks distribution | Contact Hours |
|---|---|---|---|
| I | Sports Medicine Kit, Techniques of tying various types of Bandages, Assessment Technique of various types of injuries | 15 Marks | 15 |
| II | Cardiopulmonary resuscitation (CPR) Technique, Procedure of operating Electrotherapy, infrared rays, Ultraviolet rays, Short wave Diathermy and Ultrasonic Rays | 15 Marks | 15 |
| | **Internal Assessment: 10 Marks**<br>Evaluation through Skill Test/ Assignments/ Quiz/ Viva Voce/ Practical Record File | **End Term Exam: 20 Marks**<br>Evaluation through performance in Skill Test/ Demonstration/ Viva Voce/ Practical Record File | |

## Part C-Learning Resources

**Suggested Readings:**


- Christopher M. Norris. (2012). Sports Injures Diagnosis and Management for Physiotherapists. Thomson Litho Ltd, East Kilbride.
- James, A. Gould & George J. Davies. (1999). Physical Therapy C.V. Mosby Company, Toronto
- William Prentice, (2020). Essentials of Athletic Injury Management, 11th Edition. William Prentice.
- Morris B. Million. (1998). Sports Injuries and Athletic Problem Surjeet Publication, New Delhi
- Christine, M. D., (1999). Physiology of sports and exercise. USA: Human Kinetics.
- Conley, M. (2000). *Bioenergetics of exercise training*. In T.R. Baechle, & R.W. Earle, (Eds.), Essentials of Strength Training and Conditioning Champaign, IL: Human Kinetics.
- David, R. M. (2005). *Drugs in sports,* (4th Ed). Routledge Taylor and Francis Group.
- Hunter, M. D. (1979). A *dictionary for physical educators.* In H. M. Borrow & R. McGee, (Eds.), A Practical approach to measurement in Physical Education Philadelphia: Lea & Febiger.
- Jeyaprakash, C. S., Sports Medicine, J.P. Brothers Pub., New Delhi, 2003.
- Khanna, G.L., (1990). *Exercise physiology & sports medicine*. Delhi:Lucky Enterprises.
- Mathew, D.K. & Fox, E.L, (1971). *Physiological basis of physical education and athletics*. Philadelphia:W.B. Saunders Co.
- Pandey, P.K., (1987). *Outline of sports medicine*, New Delhi: J.P. Brothers Pub.
- Williams, J. G. P. (1962). *Sports medicine*. London: Edward Arnold Ltd.
- Pande R. S. (1998) Sports Medicine. Khel Sahitya Kendra, New Delhi

**2nd Semester (Bachelor of Physical Education, Health Education and Sports Science)**
**(According to NEP2020 from Session 2023 - 24)**

# Core Course - 6

| Part A - Introduction | | | |
|---|---|---|---|
| Subject: | **Physical Education, Health Education and Sports Science** | | |
| Semester | **2nd Semester** | | |
| Name of the Course | **Officiating and Coaching** | | |
| Course Code | **23-BPE-203** | | |
| Course Type | **Core Course - 6** | | |
| Level of the Course | **100-199** | | |
| Pre-requisite (if any) | | | |
| Course Learning Outcomes (CLOs): | **After completing this course, the learner will be able to:**<br>1. Describe the Meaning, Concept and Principles of Officiating and Coaching<br>2. Explain the Philosophy, Duties and Latest technological Advancement in Officiating<br>4. Illustrate the Philosophy, Duties, Latest technological Advancements and Awards in Coaching. | | |
| | 5. Know the basic specifications of court/ground, general rules and demonstrate the basic skills of Kabaddi and Football | | |
| **Credits** | **Theory** | **Practical** | **Total** |
| | 3 | 1 | 4 |
| Contact Hours | 3 hours per week | 2 hours per week<br>(Size of practical group = 20 students) | 5 |
| **Max. Marks: 100**<br>**Part I - Theory = 70**<br>**(Internal Assessment - 20 Marks + End Term Exam – 50 Marks)**<br>**Part II - Practical = 30**<br>**(Internal Assessment - 10 Marks + End Term Exam – 20 Marks)** | | Time: 3 Hours<br>**For End Term Exam** | |

**Part B- Content of the Course**

**Instructions for Paper- Setter:**

The question paper will consist of Five Units I, II, III, IV and V. Units I, II, III & IV will have two questions from their respective Units of the Syllabus and will carry 10 marks each. Unit Vth will consist of 5 short answer type questions, which will cover the entire syllabus and will carry 2 marks for each question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Introduction of Officiating and Coaching:**<br>• Meaning, definition and concept of Officiating and Coaching<br>• Principles of Officiating and Principles of Coaching<br>• Measures for improving the standards of Officiating and Coaching<br>• Relation of official and coach with management, players/teams and spectators.<br>• Ethics for Officiating and Coaching | 11 |
| II | **Officiating**<br>• Philosophy of Officiating<br>• Duties of official in general, pre, during and post-game Duties of official for various major games and sports.<br>• Dress Codes of officials for various major games and sports<br>• Numbers of officials, Officiating positions, Signals and Movement of Officials during officiating for various major games and sports.<br>• Latest technological advancements in the Officiating in various games and sports | 12 |

| | | |
|---|---|---|
| III | **Coaching**<br>• Philosophy of Coaching<br>• Duties of coach in general, pre-game, during-game and post-game duties of coach for various major games and sports.<br>• Latest technological advancements in the coaching for various major games and sports<br>• Awards for coaches at State and National level.<br>• Famous Coaches of various major games and sports | 12 |
| IV | **Career opportunities in Coaching and Officiating**<br>• Academic and Technical Qualifications of officials for various major games and sports.<br>• Academic and Technical Qualifications of coaches for various major games and sports<br>• Famous Institutes that offer technical qualifications in Officiating and Coaching for Sports and Game<br>• Career opportunities in Officiating and Coaching: Government, Clubs, Private Sectors etc.<br>• Qualities of an ideal coach and official | 10 |

**Suggested Evaluation Methods:**

**Maximum Marks: 70 (Internal Assessment - 20 Marks + End Term Exam – 50 Marks)**

| **Internal Assessment:** | **End Term Exam: 50 Marks Time = 3 hrs** |
|---|---|
| Continuous ComprehensiveEvaluation (CCE): 20 Marks<br>Class presentation = 5<br>Seminar/ Assignment/Quiz/class test, etc. = 5<br>Mid Term Test = 10 | One question of 10 marks from each Units I to IV = 40 Marks.<br>Five Questions short answer from entire syllabus = 5 × 2 Marks = 10 Marks**.** |

**Part II – Practical**
**(Internal Assessment - 10 Marks + External – 20 Marks)**

| Unit | Topics | Marks distribution | Contact Hours |
|---|---|---|---|
| I | **Kabaddi**: Court specifications, general rules and basic skills | 15 - Marks | 15 |
| II | **Football:** Court specifications, general rules and basic skills | 15 - Marks | 15 |
| | **Internal Assessment: 10 Marks**<br>Evaluation through Assignments/ Quiz/ Viva Voce/ Practical Record File<br>(2.5 Marks for Each Unit) | **University Exam (UE): 20 Marks**<br>Evaluation through Skill of handling the instrument / Demonstration/ Viva Voce/ Practical Record File<br>(5 Marks for Each Unit) | |

## Part C-Learning Resources

**Suggested Readings:**


- John Bunn. (2010). Scientific principles of Officiating. Englewood Cliffs N.J. prentice Hall
- Bunn, J. W. (2012). The art of officiating sports. Englewood cliffs N.J. Prentice Hall.
- Bunn, J. W. (1992). Scientific principles of coaching. Englewood cliffs N. J. Prentice Hall.
- Dyson, G. H. (1963). The mechanics of athletics. London: University of London Press Ltd.
- Dyson, G. H. (1963). The mechanics of Athletics. London: University of London Press Ltd.
- Lawther, J.D. (1965). Psychology of coaching. New York: Pre. Hall.
- Singer, R. N. (1972). Coaching, athletic & psychology. New York: M.C. Graw Hill.
- Rees, Roy. (2010). Coaching Soccer Successfully Human Kinetics Windsor.
- Cavendish, Marshall. (2012). The Sportsman's World of Soccer" Marshal Cavendish London

- Worthington, Eric. (2011). Teaching Soccer Skill Lepus Books
- Taylor, Hugh. (2016). The Scottish Football Book No19 Stanley Paul, London
- Lawson P. (2001). “Soccer” National Westminster Bank Sport Coaching Series Training and Education Associates Ltd, London
- Reilly T. & Williams Mark. (2014). Science & Soccer” Routledge, London.
- John W. Dann. (2002). Scientific Principle of Coaching WCB, Brown and benchmark Publisher, U.S.A.
- VN.Rao. (2008). Art of Kabaddi. Sports Publication.

**2nd Semester (Bachelor of Physical Education, Health Education and Sports Science)**
**(According to NEP2020 from Session 2023 - 24)**

## Minor Core Course - 2

| Part A - Introduction | | | |
|---|---|---|---|
| Subject: | **Physical Education, Health Education and Sports Science** | | |
| Semester | **2nd Semester** | | |
| Name of the Course | **Asian and Commonwealth Games** | | |
| Course Code | **23-BPE-204** | | |
| Course Type | **Minor Core Course - 2** | | |
| Level of the Course | 100-199 | | |
| Pre-requisite (if any) | Course only for students studying Physical Education, Health Education and Sports Science as Major subject | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Describe the Philosophy, development and structure of Asian games.<br>2. Acquire knowledge the Philosophy, development and structure of Commonwealth games.<br>3. Describe the Indian Performance in the Commonwealth and Asina Games. | | |
| **Credits** | **Theory** | **Practical** | **Total** |
| | 2 | Nil | 2 |
| Contact Hours | 2 hours per week | Nil | 2 |
| Max. Marks: 50<br>(Internal Assessment - 15 Marks + End Term Exam – 35 Marks) | | Time: 3 Hours<br>**For** | |

**Part B- Content of the Course**

**Instructions for Paper- Setter:**

The question paper will consist of Four Units I, II, III & IV. Unit I, II and III will have two questions from their respective Units of the Syllabus and will carry 10 marks each. Unit IV will consist of 5 short answer type questions, which will cover the entire syllabus and will carry 1 mark for each question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Asian games**<br>• Philosophy of Asian games.<br>• Brief history of the development of the Asian Games.<br>• Reorganization and expansion of the Asian Games<br>• Symbols and Mascots of Asian Games<br>• Countries participating in the Asian Games<br>• Numbers of Events conducted in Asian games | 8 |
| II | **Commonwealth Games**<br>• Philosophy of Commonwealth Games.<br>• Brief history of the development of the Commonwealth Games<br>• Structure of Commonwealth Games Federation<br>• Queen's baton Relay, Opening and Closing Ceremony of Commonwealth Games<br>• Countries participating in the Commonwealth Games<br>• Numbers of Events conducted in Commonwealth Games | 8 |
| III | **Indian performance in Asian Games and Commonwealth Games**<br>• Organization of Asian Games in India<br>• Organization of Commonwealth Games in India<br>• Indian Performance in Asian Games<br>• Indian Performance in Commonwealth Games | 7 |

| **Suggested Evaluation Methods:**<br>**Maximum Marks: 50 (Internal Assessment - 15 Marks + End Term Exam – 35 Marks)** | |
|---|---|
| **Internal Assessment:**<br>Continuous ComprehensiveEvaluation (CCE): 15 Marks<br>Class presentation = 4<br>Seminar/ Assignment/Quiz/class test, etc. = 4<br>Mid Term Test = 7 | **End Term Exam: 35 Marks Time = 2 hrs**<br>One question of 10 marks from each Units I to III = 30 Marks.<br>Five Questions short answer from entire syllabus = 5 × 1 Marks = 5 Marks**.** |

## Part B - Learning Resources

Suggested Readings:

- Ajmeer Sing, Jagdish Bans, Jagtar Sing Gill , Rachpal Singh Brar and Nirmaljit Kaur Rathee ( 2004) Essentials of Physical Education, New Delhi: Kalyani Publisheres.
- https://www.commonwealthsport.com/commonwealth-games.
- https://oca.asia/media/oca_files/OCA_CONSTITUTION_AND_RULE.pdf
- https://oca.asia

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**
**Scheme of Examination for Undergraduate Programme (Interdisciplinary)**
**Bachelor of Commerce (Scheme- D)**
**as per NEP-2020 Curriculum Framework**
**(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the session 2023-2024 (in phased manner)**

| Semester | Course Type | Course Code | Nomenclature of Course | Credits | | | Contact Hours L: Lecture P: Practical T: Tutorial | | | Internal Assessment Marks | | End Term Examinations Marks | | Total Marks | Examination Hours | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Theory (T) | Tutorial (T) | L | T | Total | T | T/P | T | T/P | | T | T/P |
| **FIRST YEAR SCHEME** | | | | | | | | | | | | | | | | |
| I | CC-1 | B23-COM-101 | Financial Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-2 | B23-COM-102 | Business Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-3 | B23-COM-103 | Business Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M1 | B23-COM-104 | Business Mathematics-I | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-1 | B23-COM-105 | Personal Finance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-1 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-1 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-1 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| II | CC-4 | B23-COM-201 | Computerized Accounting System * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | **10 (P)** | 50 | **20 (P)** | 100 | 3 | 3 |
| | CC-5 | B23-COM-202 | Company Law | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-6 | B23-COM-203 | Principles of Marketing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M2 | B23-COM-204 | Business Mathematics-II | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-2 | B23-COM-205 | Fundamentals of Banking and Insurance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-2 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-2 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-2 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| **SECOND YEAR SCHEME** | | | | | | | | | | | | | | | | |
| III | CC-7 | B23-COM-301 | Corporate Accounting-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-8 | B23-COM-302 | Income Tax Law-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-9 | B23-COM-303 | Banking and Insurance | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M3 | B23-COM-304 | Business Economics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | MDC-3 | B23-COM-305 | Fundamentals of Indian Capital Markets | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-3 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-3 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IV | CC-10 | B23-COM-401 | Corporate Accounting-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-11 | B23-COM-402 | Income Tax Law-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-12 | B23-COM-403 | Entrepreneurship Development | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M4(V) | B23-VOC-208 | GST Return Filing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | AEC-4 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | VAC-3 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| **THIRD YEAR SCHEME** | | | | | | | | | | | | | | | | |
| V | CC-13 | B23-COM-501 | Cost Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-14 | B23-COM-502 | GST & Custom Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-15 | B23-COM-503 | Industrial Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M5(V) | B23-COM-504 | Corporate Secretarial Practices | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VI | CC-16 | B23-COM-601 | Management Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-17 | B23-COM-602 | Corporate Governance & Auditing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-18 | B23-COM-603 | Business Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M6 | B23-COM-604 | Business Environment of Haryana | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M7(V) | B23-COM-605 | Advertising and Personal Selling | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |

| FOURTH YEAR SCHEME D - BACHELOR OF COMMERCE (HONOURS) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H6 | B23-COM-803 | International Business | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSC-H2 (any one) | B23-COM-804 | Business Ethics & CSR | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-805 | Corporate & Security Valuation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H2 | B23-COM-806 | Stock Market Operations * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM2 | B23-COM-807 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |

| FOURTH YEAR SCHEME D - BACHELOR OF COMMERCE (HONOURS WITH RESEARCH) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-HM2 | B23-COM-806 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-807 | Project/Dissertation Report | 12 | - | - | - | - | - | - | - | 300 | - | 300 | - | - |

***Practical Course**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**
**Scheme of Examination for Undergraduate Programme (Interdisciplinary) -Scheme- D**
**B.Com. Vocational (Advertising, Sales promotion & Sales Management)**
**as per NEP-2020 Curriculum Framework**
**(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the session 2023-2024 (in phased manner)**

| Semester | Course Type | Course Code | Nomenclature of Course | Credits | | | Contact Hours L: Lecture P: Practical T: Tutorial | | | Internal Assessment Marks | | End Term Examinations Marks | | Total Marks | Examination Hours | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Theory (T) | Tutorial (T) | L | T | Total | T | T/P | T | T/P | | T | T/P |
| **FIRST YEAR SCHEME** | | | | | | | | | | | | | | | | |
| I | CC-1 | B23-COM-101 | Financial Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-2 | B23-COM-102 | Business Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-3 | B23-COM-103 | Business Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M1 | B23-COM-104 | Business Mathematics-I | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-1 | B23-COM-105 | Personal Finance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-1 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-1 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-1 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| II | CC-4 | B23-COM-201 | Computerized Accounting System * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | **10 (P)** | 50 | **20 (P)** | 100 | 3 | 3 |
| | CC-5 | B23-COM-202 | Company Law | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-6 | B23-COM-203 | Principles of Marketing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M2 | B23-COM-204 | Business Mathematics-II | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-2 | B23-COM-205 | Fundamentals of Banking and Insurance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-2 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-2 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-2 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SECOND YEAR SCHEME** | | | | | | | | | | | | | | | | |
| III | CC-7 | B23-COM-301 | Corporate Accounting-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-8 | B23-COM-302 | Income Tax Law-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-9 | B23-COM-303 | Marketing Communication | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M3 | B23-COM-304 | Business Economics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | MDC-3 | B23-COM-305 | Fundamentals of Indian Capital Markets | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-3 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-3 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| IV | CC-10 | B23-COM-401 | Corporate Accounting-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-11 | B23-COM-402 | Income Tax Law-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-12 | B23-COM-403 | Entrepreneurship Development | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M4(V) | B23-VOC-208 | GST Return Filing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | AEC-4 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | VAC-3 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| **THIRD YEAR SCHEME** | | | | | | | | | | | | | | | | |
| V | CC-13 | B23-COM-501 | Cost Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-14 | B23-COM-502 | GST & Custom Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-15 | B23-COM-503 | Creativity and Advertising | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M5(V) | B23-COM-504 | Corporate Secretarial Practices | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VI | CC-16 | B23-COM-601 | Management Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-17 | B23-COM-602 | Managing Sales Force | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-18 | B23-COM-603 | Business Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M6 | B23-COM-604 | Business Environment of Haryana | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M7(V) | B23-COM-605 | Advertising and Personal Selling | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |

| FOURTH YEAR SCHEME (HONOURS) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H6 | B23-COM-803 | International Business | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSC-H2 (any one) | B23-COM-804 | Business Ethics & CSR | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-805 | Corporate & Security Valuation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H2 | B23-COM-806 | Stock Market Operations * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM2 | B23-COM-807 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| OR | | | | | | | | | | | | | | | | |

| FOURTH YEAR SCHEME (HONOURS WITH RESEARCH) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-HM2 | B23-COM-806 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-807 | Project/Dissertation Report | 12 | - | - | - | - | - | - | - | 300 | - | 300 | - | - |

***Practical Course**

**Note: - Syllabus of courses other than CC-9; CC-15 and CC-17 is same as that of the corresponding courses in B.Com.**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**
**Scheme of Examination for Undergraduate Programme (Interdisciplinary) -Scheme- D**
**B.Com. Vocational (Banking & Insurance)**
**as per NEP-2020 Curriculum Framework**
**(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the session 2023-2024 (in phased manner)**

| Semester | Course Type | Course Code | Nomenclature of Course | Credits | | | Contact Hours L: Lecture P: Practical T: Tutorial | | | Internal Assessment Marks | | End Term Examinations Marks | | Total Marks | Examination Hours | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Theory (T) | Tutorial (T) | L | T | Total | T | T/P | T | T/P | | T | T/P |
| **FIRST YEAR SCHEME** | | | | | | | | | | | | | | | | |
| I | CC-1 | B23-COM-101 | Financial Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-2 | B23-COM-102 | Business Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-3 | B23-COM-103 | Business Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M1 | B23-COM-104 | Business Mathematics-I | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-1 | B23-COM-105 | Personal Finance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-1 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-1 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-1 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| II | CC-4 | B23-COM-201 | Computerized Accounting System * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | **10 (P)** | 50 | **20 (P)** | 100 | 3 | 3 |
| | CC-5 | B23-COM-202 | Company Law | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-6 | B23-COM-203 | Principles of Marketing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M2 | B23-COM-204 | Business Mathematics-II | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-2 | B23-COM-205 | Fundamentals of Banking and Insurance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-2 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-2 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-2 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SECOND YEAR SCHEME** | | | | | | | | | | | | | | | | |
| III | CC-7 | B23-COM-301 | Corporate Accounting-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-8 | B23-COM-302 | Income Tax Law-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-9 | B23-COM-303 | Regulatory Framework of Banking | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M3 | B23-COM-304 | Business Economics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | MDC-3 | B23-COM-305 | Fundamentals of Indian Capital Markets | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-3 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-3 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| IV | CC-10 | B23-COM-401 | Corporate Accounting-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-11 | B23-COM-402 | Income Tax Law-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-12 | B23-COM-403 | Entrepreneurship Development | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M4(V) | B23-VOC-208 | GST Return Filing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | AEC-4 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | VAC-3 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| **THIRD YEAR SCHEME** | | | | | | | | | | | | | | | | |
| V | CC-13 | B23-COM-501 | Cost Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-14 | B23-COM-502 | GST & Custom Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-15 | B23-COM-503 | Regulatory Framework of Insurance | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M5(V) | B23-COM-504 | Corporate Secretarial Practices | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VI | CC-16 | B23-COM-601 | Management Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-17 | B23-COM-602 | Banking & Insurance Operations | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-18 | B23-COM-603 | Business Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M6 | B23-COM-604 | Business Environment of Haryana | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M7(V) | B23-COM-605 | Advertising and Personal Selling | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |

| FOURTH YEAR SCHEME (HONOURS) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H6 | B23-COM-803 | International Business | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSC-H2 (any one) | B23-COM-804 | Business Ethics & CSR | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-805 | Corporate & Security Valuation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H2 | B23-COM-806 | Stock Market Operations * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM2 | B23-COM-807 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| OR | | | | | | | | | | | | | | | | |

| FOURTH YEAR SCHEME (HONOURS WITH RESEARCH) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-HM2 | B23-COM-806 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-807 | Project/Dissertation Report | 12 | - | - | - | - | - | - | - | 300 | - | 300 | - | - |

***Practical Course**

**Note: - Syllabus of courses other than CC-9; CC-15 and CC-17 is same as that of the corresponding courses in B.Com.**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**Scheme of Examination for Undergraduate Programme (Interdisciplinary) -Scheme- D**

**B.Com. Vocational (Computer Applications)**

**as per NEP-2020 Curriculum Framework**

**(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the session 2023-2024 (in phased manner)**

| Semester | Course Type | Course Code | Nomenclature of Course | Credits | | | Contact Hours L: Lecture P: Practical T: Tutorial | | | Internal Assessment Marks | | End Term Examinations Marks | | Total Marks | Examination Hours | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Theory (T) | Tutorial (T) | L | T | Total | T | T/P | T | T/P | | T | T/P |
| **FIRST YEAR SCHEME** | | | | | | | | | | | | | | | | |
| I | CC-1 | B23-COM-101 | Financial Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-2 | B23-COM-102 | Business Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-3 | B23-COM-103 | Business Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M1 | B23-COM-104 | Business Mathematics-I | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-1 | B23-COM-105 | Personal Finance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-1 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-1 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-1 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| II | CC-4 | B23-COM-201 | Computerized Accounting System * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | **10 (P)** | 50 | **20 (P)** | 100 | 3 | 3 |
| | CC-5 | B23-COM-202 | Company Law | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-6 | B23-COM-203 | Principles of Marketing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M2 | B23-COM-204 | Business Mathematics-II | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-2 | B23-COM-205 | Fundamentals of Banking and Insurance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-2 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-2 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-2 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SECOND YEAR SCHEME** | | | | | | | | | | | | | | | | |
| III | CC-7 | B23-COM-301 | Corporate Accounting-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-8 | B23-COM-302 | Income Tax Law-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-9 | B23-COM-303 | Programming for Problem Solving | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M3 | B23-COM-304 | Business Economics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | MDC-3 | B23-COM-305 | Fundamentals of Indian Capital Markets | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-3 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-3 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| IV | CC-10 | B23-COM-401 | Corporate Accounting-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-11 | B23-COM-402 | Income Tax Law-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-12 | B23-COM-403 | Entrepreneurship Development | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M4(V) | B23-VOC-208 | GST Return Filing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | AEC-4 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | VAC-3 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| **THIRD YEAR SCHEME** | | | | | | | | | | | | | | | | |
| V | CC-13 | B23-COM-501 | Cost Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-14 | B23-COM-502 | GST & Custom Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-15 | B23-COM-503 | Database Management System | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M5(V) | B23-COM-504 | Corporate Secretarial Practices | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VI | CC-16 | B23-COM-601 | Management Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-17 | B23-COM-602 | Networking and ERP | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-18 | B23-COM-603 | Business Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M6 | B23-COM-604 | Business Environment of Haryana | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M7(V) | B23-COM-605 | Advertising and Personal Selling | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |

| FOURTH YEAR SCHEME (HONOURS) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H6 | B23-COM-803 | International Business | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSC-H2 (any one) | B23-COM-804 | Business Ethics & CSR | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-805 | Corporate & Security Valuation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H2 | B23-COM-806 | Stock Market Operations * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM2 | B23-COM-807 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| OR | | | | | | | | | | | | | | | | |

| FOURTH YEAR SCHEME (HONOURS WITH RESEARCH) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-HM2 | B23-COM-806 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-807 | Project/Dissertation Report | 12 | - | - | - | - | - | - | - | 300 | - | 300 | - | - |

***Practical Course**

**Note: - Syllabus of courses other than CC-9; CC-15 and CC-17 is same as that of the corresponding courses in B.Com.**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**Scheme of Examination for Undergraduate Programme (Interdisciplinary) -Scheme- D**

**B.Com. Vocational (E-Commerce)**

**as per NEP-2020 Curriculum Framework**

**(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the session 2023-2024 (in phased manner)**

| Semester | Course Type | Course Code | Nomenclature of Course | Credits | | | Contact Hours L: Lecture P: Practical T: Tutorial | | | Internal Assessment Marks | | End Term Examinations Marks | | Total Marks | Examination Hours | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Theory (T) | Tutorial (T) | L | T | Total | T | T/P | T | T/P | | T | T/P |
| **FIRST YEAR SCHEME** | | | | | | | | | | | | | | | | |
| I | CC-1 | B23-COM-101 | Financial Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-2 | B23-COM-102 | Business Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-3 | B23-COM-103 | Business Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M1 | B23-COM-104 | Business Mathematics-I | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-1 | B23-COM-105 | Personal Finance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-1 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-1 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-1 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| II | CC-4 | B23-COM-201 | Computerized Accounting System * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | **10 (P)** | 50 | **20 (P)** | 100 | 3 | 3 |
| | CC-5 | B23-COM-202 | Company Law | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-6 | B23-COM-203 | Principles of Marketing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M2 | B23-COM-204 | Business Mathematics-II | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-2 | B23-COM-205 | Fundamentals of Banking and Insurance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-2 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-2 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-2 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SECOND YEAR SCHEME** | | | | | | | | | | | | | | | | |
| III | CC-7 | B23-COM-301 | Corporate Accounting-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-8 | B23-COM-302 | Income Tax Law-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-9 | B23-COM-303 | Fundamentals of E-Commerce | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M3 | B23-COM-304 | Business Economics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | MDC-3 | B23-COM-305 | Fundamentals of Indian Capital Markets | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-3 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-3 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| IV | CC-10 | B23-COM-401 | Corporate Accounting-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-11 | B23-COM-402 | Income Tax Law-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-12 | B23-COM-403 | Entrepreneurship Development | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M4(V) | B23-VOC-208 | GST Return Filing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | AEC-4 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | VAC-3 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| **THIRD YEAR SCHEME** | | | | | | | | | | | | | | | | |
| V | CC-13 | B23-COM-501 | Cost Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-14 | B23-COM-502 | GST & Custom Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-15 | B23-COM-503 | M-Commerce | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M5(V) | B23-COM-504 | Corporate Secretarial Practices | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VI | CC-16 | B23-COM-601 | Management Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-17 | B23-COM-602 | Internet and Web Design | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-18 | B23-COM-603 | Business Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M6 | B23-COM-604 | Business Environment of Haryana | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M7(V) | B23-COM-605 | Advertising and Personal Selling | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |

| FOURTH YEAR SCHEME (HONOURS) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H6 | B23-COM-803 | International Business | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSC-H2 (any one) | B23-COM-804 | Business Ethics & CSR | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-805 | Corporate & Security Valuation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H2 | B23-COM-806 | Stock Market Operations * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM2 | B23-COM-807 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| OR | | | | | | | | | | | | | | | | |

| FOURTH YEAR SCHEME (HONOURS WITH RESEARCH) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-HM2 | B23-COM-806 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-807 | Project/Dissertation Report | 12 | - | - | - | - | - | - | - | 300 | - | 300 | - | - |

***Practical Course**

**Note: - Syllabus of courses other than CC-9; CC-15 and CC-17 is same as that of the corresponding courses in B.Com.**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**Scheme of Examination for Undergraduate Programme (Interdisciplinary) -Scheme- D**

**B.Com. Vocational (Foreign Trade Practices and Procedures)**

**as per NEP-2020 Curriculum Framework**

**(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the session 2023-2024 (in phased manner)**

| Semester | Course Type | Course Code | Nomenclature of Course | Credits | | | Contact Hours L: Lecture P: Practical T: Tutorial | | | Internal Assessment Marks | | End Term Examinations Marks | | Total Marks | Examination Hours | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Theory (T) | Tutorial (T) | L | T | Total | T | T/P | T | T/P | | T | T/P |
| **FIRST YEAR SCHEME** | | | | | | | | | | | | | | | | |
| I | CC-1 | B23-COM-101 | Financial Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-2 | B23-COM-102 | Business Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-3 | B23-COM-103 | Business Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M1 | B23-COM-104 | Business Mathematics-I | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-1 | B23-COM-105 | Personal Finance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-1 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-1 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-1 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| II | CC-4 | B23-COM-201 | Computerized Accounting System * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | **10 (P)** | 50 | **20 (P)** | 100 | 3 | 3 |
| | CC-5 | B23-COM-202 | Company Law | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-6 | B23-COM-203 | Principles of Marketing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M2 | B23-COM-204 | Business Mathematics-II | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-2 | B23-COM-205 | Fundamentals of Banking and Insurance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-2 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-2 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-2 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SECOND YEAR SCHEME** | | | | | | | | | | | | | | | | |
| III | CC-7 | B23-COM-301 | Corporate Accounting-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-8 | B23-COM-302 | Income Tax Law-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-9 | B23-COM-303 | Export Procedures & Documentation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M3 | B23-COM-304 | Business Economics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | MDC-3 | B23-COM-305 | Fundamentals of Indian Capital Markets | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-3 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-3 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| IV | CC-10 | B23-COM-401 | Corporate Accounting-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-11 | B23-COM-402 | Income Tax Law-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-12 | B23-COM-403 | Entrepreneurship Development | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M4(V) | B23-VOC-208 | GST Return Filing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | AEC-4 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | VAC-3 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| **THIRD YEAR SCHEME** | | | | | | | | | | | | | | | | |
| V | CC-13 | B23-COM-501 | Cost Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-14 | B23-COM-502 | GST & Custom Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-15 | B23-COM-503 | International Logistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M5(V) | B23-COM-504 | Corporate Secretarial Practices | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VI | CC-16 | B23-COM-601 | Management Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-17 | B23-COM-602 | Foreign Trade Policy | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-18 | B23-COM-603 | Business Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M6 | B23-COM-604 | Business Environment of Haryana | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M7(V) | B23-COM-605 | Advertising and Personal Selling | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |

| FOURTH YEAR SCHEME (HONOURS) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H6 | B23-COM-803 | International Business | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSC-H2 (any one) | B23-COM-804 | Business Ethics & CSR | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-805 | Corporate & Security Valuation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H2 | B23-COM-806 | Stock Market Operations * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM2 | B23-COM-807 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| OR | | | | | | | | | | | | | | | | |

| FOURTH YEAR SCHEME (HONOURS WITH RESEARCH) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-HM2 | B23-COM-806 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-807 | Project/Dissertation Report | 12 | - | - | - | - | - | - | - | 300 | - | 300 | - | - |

***Practical Course**

**Note: - Syllabus of courses other than CC-9; CC-15 and CC-17 is same as that of the corresponding courses in B.Com.**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**Scheme of Examination for Undergraduate Programme (Interdisciplinary) -Scheme- D**

**B.Com. Vocational (Office Management and Secretarial Practice)**

**as per NEP-2020 Curriculum Framework**

**(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the session 2023-2024 (in phased manner)**

| Semester | Course Type | Course Code | Nomenclature of Course | Credits | | | Contact Hours L: Lecture P: Practical T: Tutorial | | | Internal Assessment Marks | | End Term Examinations Marks | | Total Marks | Examination Hours | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Theory (T) | Tutorial (T) | L | T | Total | T | T/P | T | T/P | | T | T/P |
| **FIRST YEAR SCHEME** | | | | | | | | | | | | | | | | |
| I | CC-1 | B23-COM-101 | Financial Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-2 | B23-COM-102 | Business Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-3 | B23-COM-103 | Business Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M1 | B23-COM-104 | Business Mathematics-I | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-1 | B23-COM-105 | Personal Finance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-1 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-1 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-1 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| II | CC-4 | B23-COM-201 | Computerized Accounting System * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | **10 (P)** | 50 | **20 (P)** | 100 | 3 | 3 |
| | CC-5 | B23-COM-202 | Company Law | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-6 | B23-COM-203 | Principles of Marketing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M2 | B23-COM-204 | Business Mathematics-II | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-2 | B23-COM-205 | Fundamentals of Banking and Insurance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-2 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-2 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-2 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SECOND YEAR SCHEME** | | | | | | | | | | | | | | | | |
| III | CC-7 | B23-COM-301 | Corporate Accounting-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-8 | B23-COM-302 | Income Tax Law-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-9 | B23-COM-303 | Office Management & Practices | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M3 | B23-COM-304 | Business Economics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | MDC-3 | B23-COM-305 | Fundamentals of Indian Capital Markets | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-3 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-3 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| IV | CC-10 | B23-COM-401 | Corporate Accounting-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-11 | B23-COM-402 | Income Tax Law-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-12 | B23-COM-403 | Entrepreneurship Development | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M4(V) | B23-VOC-208 | GST Return Filing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | AEC-4 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | VAC-3 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| **THIRD YEAR SCHEME** | | | | | | | | | | | | | | | | |
| V | CC-13 | B23-COM-501 | Cost Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-14 | B23-COM-502 | GST & Custom Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-15 | B23-COM-503 | Computer Typing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M5(V) | B23-COM-504 | Corporate Secretarial Practices | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VI | CC-16 | B23-COM-601 | Management Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-17 | B23-COM-602 | Communication and Automation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-18 | B23-COM-603 | Business Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M6 | B23-COM-604 | Business Environment of Haryana | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M7(V) | B23-COM-605 | Advertising and Personal Selling | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |

| FOURTH YEAR SCHEME (HONOURS) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H6 | B23-COM-803 | International Business | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSC-H2 (any one) | B23-COM-804 | Business Ethics & CSR | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-805 | Corporate & Security Valuation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H2 | B23-COM-806 | Stock Market Operations * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM2 | B23-COM-807 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| OR | | | | | | | | | | | | | | | | |

| FOURTH YEAR SCHEME (HONOURS WITH RESEARCH) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-HM2 | B23-COM-806 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-807 | Project/Dissertation Report | 12 | - | - | - | - | - | - | - | 300 | - | 300 | - | - |

***Practical Course**

**Note: - Syllabus of courses other than CC-9; CC-15 and CC-17 is same as that of the corresponding courses in B.Com.**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**Scheme of Examination for Undergraduate Programme (Interdisciplinary) -Scheme- D**

**B.Com. Vocational (Principles and Practice of Insurance)**

**as per NEP-2020 Curriculum Framework**

**(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the session 2023-2024 (in phased manner)**

| Semester | Course Type | Course Code | Nomenclature of Course | Credits | | | Contact Hours L: Lecture P: Practical T: Tutorial | | | Internal Assessment Marks | | End Term Examinations Marks | | Total Marks | Examination Hours | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Theory (T) | Tutorial (T) | L | T | Total | T | T/P | T | T/P | | T | T/P |
| **FIRST YEAR SCHEME** | | | | | | | | | | | | | | | | |
| I | CC-1 | B23-COM-101 | Financial Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-2 | B23-COM-102 | Business Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-3 | B23-COM-103 | Business Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M1 | B23-COM-104 | Business Mathematics-I | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-1 | B23-COM-105 | Personal Finance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-1 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-1 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-1 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| II | CC-4 | B23-COM-201 | Computerized Accounting System * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | **10 (P)** | 50 | **20 (P)** | 100 | 3 | 3 |
| | CC-5 | B23-COM-202 | Company Law | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-6 | B23-COM-203 | Principles of Marketing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M2 | B23-COM-204 | Business Mathematics-II | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-2 | B23-COM-205 | Fundamentals of Banking and Insurance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-2 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-2 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-2 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SECOND YEAR SCHEME** | | | | | | | | | | | | | | | | |
| III | CC-7 | B23-COM-301 | Corporate Accounting-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-8 | B23-COM-302 | Income Tax Law-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-9 | B23-COM-303 | Life and General Insurance | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M3 | B23-COM-304 | Business Economics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | MDC-3 | B23-COM-305 | Fundamentals of Indian Capital Markets | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-3 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-3 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| IV | CC-10 | B23-COM-401 | Corporate Accounting-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-11 | B23-COM-402 | Income Tax Law-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-12 | B23-COM-403 | Entrepreneurship Development | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M4(V) | B23-VOC-208 | GST Return Filing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | AEC-4 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | VAC-3 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| **THIRD YEAR SCHEME** | | | | | | | | | | | | | | | | |
| V | CC-13 | B23-COM-501 | Cost Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-14 | B23-COM-502 | GST & Custom Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-15 | B23-COM-503 | Principles of Insurance | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M5(V) | B23-COM-504 | Corporate Secretarial Practices | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VI | CC-16 | B23-COM-601 | Management Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-17 | B23-COM-602 | Regulatory Framework of Insurance | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-18 | B23-COM-603 | Business Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M6 | B23-COM-604 | Business Environment of Haryana | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M7(V) | B23-COM-605 | Advertising and Personal Selling | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |

| FOURTH YEAR SCHEME (HONOURS) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H6 | B23-COM-803 | International Business | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSC-H2 (any one) | B23-COM-804 | Business Ethics & CSR | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-805 | Corporate & Security Valuation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H2 | B23-COM-806 | Stock Market Operations * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM2 | B23-COM-807 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| OR | | | | | | | | | | | | | | | | |

| FOURTH YEAR SCHEME (HONOURS WITH RESEARCH) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-HM2 | B23-COM-806 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-807 | Project/Dissertation Report | 12 | - | - | - | - | - | - | - | 300 | - | 300 | - | - |

***Practical Course**

**Note: - Syllabus of courses other than CC-9; CC-15 and CC-17 is same as that of the corresponding courses in B.Com.**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**Scheme of Examination for Undergraduate Programme (Interdisciplinary) -Scheme- D**

**B.Com. Vocational (Tax Procedures & Practices)**

**as per NEP-2020 Curriculum Framework**

**(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the session 2023-2024 (in phased manner)**

| Semester | Course Type | Course Code | Nomenclature of Course | Credits | | | Contact Hours L: Lecture P: Practical T: Tutorial | | | Internal Assessment Marks | | End Term Examinations Marks | | Total Marks | Examination Hours | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Theory (T) | Tutorial (T) | L | T | Total | T | T/P | T | T/P | | T | T/P |
| **FIRST YEAR SCHEME** | | | | | | | | | | | | | | | | |
| I | CC-1 | B23-COM-101 | Financial Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-2 | B23-COM-102 | Business Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-3 | B23-COM-103 | Business Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M1 | B23-COM-104 | Business Mathematics-I | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-1 | B23-COM-105 | Personal Finance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-1 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-1 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-1 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| II | CC-4 | B23-COM-201 | Computerized Accounting System * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | **10 (P)** | 50 | **20 (P)** | 100 | 3 | 3 |
| | CC-5 | B23-COM-202 | Company Law | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-6 | B23-COM-203 | Principles of Marketing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M2 | B23-COM-204 | Business Mathematics-II | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-2 | B23-COM-205 | Fundamentals of Banking and Insurance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-2 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-2 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-2 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SECOND YEAR SCHEME** | | | | | | | | | | | | | | | | |
| III | CC-7 | B23-COM-301 | Corporate Accounting-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-8 | B23-COM-302 | Income Tax Law-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-9 | B23-COM-303 | Corporate Taxation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M3 | B23-COM-304 | Business Economics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | MDC-3 | B23-COM-305 | Fundamentals of Indian Capital Markets | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-3 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-3 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| IV | CC-10 | B23-COM-401 | Corporate Accounting-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-11 | B23-COM-402 | Income Tax Law-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-12 | B23-COM-403 | Entrepreneurship Development | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M4(V) | B23-VOC-208 | GST Return Filing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | AEC-4 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | VAC-3 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| **THIRD YEAR SCHEME** | | | | | | | | | | | | | | | | |
| V | CC-13 | B23-COM-501 | Cost Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-14 | B23-COM-502 | GST & Custom Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-15 | B23-COM-503 | Corporate Tax Planning | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M5(V) | B23-COM-504 | Corporate Secretarial Practices | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VI | CC-16 | B23-COM-601 | Management Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-17 | B23-COM-602 | International Taxation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-18 | B23-COM-603 | Business Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M6 | B23-COM-604 | Business Environment of Haryana | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M7(V) | B23-COM-605 | Advertising and Personal Selling | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |

| FOURTH YEAR SCHEME (HONOURS) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H6 | B23-COM-803 | International Business | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSC-H2 (any one) | B23-COM-804 | Business Ethics & CSR | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-805 | Corporate & Security Valuation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H2 | B23-COM-806 | Stock Market Operations * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM2 | B23-COM-807 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| OR | | | | | | | | | | | | | | | | |

| FOURTH YEAR SCHEME (HONOURS WITH RESEARCH) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-HM2 | B23-COM-806 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-807 | Project/Dissertation Report | 12 | - | - | - | - | - | - | - | 300 | - | 300 | - | - |

***Practical Course**

**Note: - Syllabus of courses other than CC-9; CC-15 and CC-17 is same as that of the corresponding courses in B.Com.**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**Scheme of Examination for Undergraduate Programme (Interdisciplinary) -Scheme- D**

**B.Com. Vocational (Tourism & Travel Management)**

**as per NEP-2020 Curriculum Framework**

**(Multiple Entry-Exit, Internships and Choice Based Credit System LOCF) w.e.f. the session 2023-2024 (in phased manner)**

| Semester | Course Type | Course Code | Nomenclature of Course | Credits | | | Contact Hours L: Lecture P: Practical T: Tutorial | | | Internal Assessment Marks | | End Term Examinations Marks | | Total Marks | Examination Hours | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Theory (T) | Tutorial (T) | L | T | Total | T | T/P | T | T/P | | T | T/P |
| **FIRST YEAR SCHEME** | | | | | | | | | | | | | | | | |
| I | CC-1 | B23-COM-101 | Financial Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-2 | B23-COM-102 | Business Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-3 | B23-COM-103 | Business Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M1 | B23-COM-104 | Business Mathematics-I | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-1 | B23-COM-105 | Personal Finance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-1 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-1 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-1 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| II | CC-4 | B23-COM-201 | Computerized Accounting System * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | **10 (P)** | 50 | **20 (P)** | 100 | 3 | 3 |
| | CC-5 | B23-COM-202 | Company Law | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-6 | B23-COM-203 | Principles of Marketing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M2 | B23-COM-204 | Business Mathematics-II | 2 | 1 | 1 | 1 | 1 | 2 | 15 | - | 35 | - | 50 | 3 | - |
| | MDC-2 | B23-COM-205 | Fundamentals of Banking and Insurance | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-2 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-2 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| | VAC-2 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SECOND YEAR SCHEME** | | | | | | | | | | | | | | | | |
| III | CC-7 | B23-COM-301 | Corporate Accounting-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-8 | B23-COM-302 | Income Tax Law-I | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-9 | B23-COM-303 | Tourism Business | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M3 | B23-COM-304 | Business Economics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | MDC-3 | B23-COM-305 | Fundamentals of Indian Capital Markets | 3 | 2 | 1 | 2 | 1 | 3 | 25 | - | 50 | - | 75 | 3 | - |
| | AEC-3 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | SEC-3 | Select one course from the pool of Skill Enhancement Courses ( SEC) | | | | | | | | | | | | | | |
| IV | CC-10 | B23-COM-401 | Corporate Accounting-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-11 | B23-COM-402 | Income Tax Law-II | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-12 | B23-COM-403 | Entrepreneurship Development | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M4(V) | B23-VOC-208 | GST Return Filing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | AEC-4 | Select one course from the pool of Ability Enhancement Courses ( AEC) | | | | | | | | | | | | | | |
| | VAC-3 | Select one course from the pool of Value Added Courses ( VAC) | | | | | | | | | | | | | | |
| **THIRD YEAR SCHEME** | | | | | | | | | | | | | | | | |
| V | CC-13 | B23-COM-501 | Cost Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-14 | B23-COM-502 | GST & Custom Laws | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-15 | B23-COM-503 | Tourism in India | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M5(V) | B23-COM-504 | Corporate Secretarial Practices | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VI | CC-16 | B23-COM-601 | Management Accounting | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-17 | B23-COM-602 | Tour and Travel Operations | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-18 | B23-COM-603 | Business Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M6 | B23-COM-604 | Business Environment of Haryana | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-M7(V) | B23-COM-605 | Advertising and Personal Selling | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |

| FOURTH YEAR SCHEME (HONOURS) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H6 | B23-COM-803 | International Business | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSC-H2 (any one) | B23-COM-804 | Business Ethics & CSR | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-805 | Corporate & Security Valuation | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H2 | B23-COM-806 | Stock Market Operations * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM2 | B23-COM-807 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| OR | | | | | | | | | | | | | | | | |

| FOURTH YEAR SCHEME (HONOURS WITH RESEARCH) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VII | CC-H1 | B23-COM-701 | Organizational Behaviour | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H2 | B23-COM-702 | Advanced Statistics | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H3 | B23-COM-703 | Indian Business Environment | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | DSE-H1 (any one) | B23-COM-704 | Business Research Methods | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-705 | Strategic Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | PC-H1 | B23-COM-706 | Analysis of Financial Statements * | 4 | 3 | 1 | 2 | 4 | 6 | 20 | 10 | 50 | 20 | 100 | 3 | 3 |
| | CC-HM1 | B23-COM-707 | Retailing | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| VIII | CC-H4 | B23-COM-801 | Human Resource Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-H5 | B23-COM-802 | Financial Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | CC-HM2 | B23-COM-806 | Supply Chain Management | 4 | 3 | 1 | 3 | 1 | 4 | 30 | - | 70 | - | 100 | 3 | - |
| | | B23-COM-807 | Project/Dissertation Report | 12 | - | - | - | - | - | - | - | 300 | - | 300 | - | - |

***Practical Course**

**Note: - Syllabus of courses other than CC-9; CC-15 and CC-17 is same as that of the corresponding courses in B.Com.**

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Commerce | | |
| Semester | II | | |
| Name of the Course | Computerized Accounting System* | | |
| Course Code | B23-COM-201 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/VAC | CC-4 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. understand the concept of computerized accounting and be familiar with accounting software.<br>2. create company ledger, vouchers in accounts software.<br>3. prepare financial statements in Tally.<br>4. comply with tax regulations – GST, Income Tax, etc. | | |
| | 5*. make journal entries, ledgers, trial balance, profit and loss account, balance sheet and records, other business operations on Computerized accounting software, such as Tally Prime (Latest Version). | | |
| | **Theory** | **Practical** | **Total** |
| Credits | 3 | 1 | 4 |
| Internal Assessment Marks | 20 | 10 | 30 |
| End Term Exam Marks | 50 | 20 | 70 |
| Exam Time | 3 Hrs. | 3 Hrs. | |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprises of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 09 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Computerized Accounting System: Concept, Tally Prime, installations of Tally Prime, licensing configurations; Tally vault password: Security | 12 |

| | | |
|---|---|---|
| | control in Tally Prime, data backup and restore, export and import data, edit log feature in tally; Gateway of Tally. | |
| II | Company creation: Setup features, accounting features, configuration, shutting and deleting a company; Ledger creation: Creating single and multiple ledgers, altering, deleting and displaying ledger; Invoicing; Budgets; Cost centres; Interest calculations; Inventory: Stock items, purchase and sales orders processing, godowns. | 11 |
| III | Financial Statements: Profit & loss account, balance sheet; Bank reconciliation; Debit and credit note; Tally audit features; Printing features; Management Information System & different reports in tally. | 11 |
| IV | Income tax and GST in Tally Prime; TDS; TCS; Payroll in Tally: Introduction, salary accounting, payroll masters, payroll vouchers, gratuity, provident fund, ESI, payroll reports. | 11 |
| V* | Procedures to create a company, prepare a profit and loss account, prepare Balance sheet, show some entries of TDS and TCS, GST entries in Tally Payroll in Tally. | 30 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory: 20**<br>Class Participation: 5<br>Seminar/Presentation/Assignment/Quiz/Class Test etc.: 5<br>Mid Term Exam:10<br>➢ **Practicum: 10**<br>Class Participation: 5<br>Seminar/Demonstration/Viva Voce/Lab Records etc.: 5<br>Mid Term Exam: | **End Term Exam** |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- A.K. Nadhavi, Managing VAT with Tally 9 (Taxation), BPB Publications, New Delhi.
- Ashok K. Nadavi, Tally Training Guide (Financial Accounting, Invoicing & Inventory), BPB Publications, New Delhi.
- Ashok, K. Nadhavi, Kishor K. Nadhavi, Implementary Tally 9, BPB Publications, New Delhi.
- Bansal Manoj, Computerized Accounting System, Sahitya Bhawan Publications.
- Kavitha et. al., Computerized Accounting, Himalaya Publishing House.
- Raman B.S. and Singh Ravi, Computerized Accounting System, EPBP Publication.

* Applicable for courses having practical component.

# IT Return Filing

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Commerce | | |
| Semester | III & V | | |
| Name of the Course | IT Return Filing | | |
| Course Code | B23-VOC-108 | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/ VAC | VOC | | |
| Level of the course (As per Annexure-I) | 200-299 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br><br>1. understand the basic process of computing taxable income and tax liability, and know about various types of income tax return forms.<br>2. know the difference between e-filing and regular filing of Income tax returns and understand the circumstances when e-filling is mandatory.<br>3. understand the concept of advance payment of tax and tax deduction at source<br>4. Understand different types of returns and the procedure of e-filing of return | | |
| | 5*.practical knowledge about income tax return filing | | |
| | **Theory** | **Practical** | **Total** |
| Credits | 3 | 1 | 4 |
| Internal Assessment Marks | 20 | 10 | 30 |
| End Term Exam Marks | 50 | 20 | 70 |
| Exam Time | 3 Hrs. | 3 Hrs | |

| Part-B Contents of the Course | | |
|---|---|---|
| **Instructions for Paper Setters**<br>1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprises of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 09 marks each, having two questions from each unit.<br>2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Income Tax, Brief introduction to income under the heads "Salaries ; House Property , Capital Gains and Other Sources" | 12 |
| II | Clubbing of income and set-off and carry forward of Losses ; Deductions , Rebates and Relief under Income Tax Act, Computation of taxable income and tax liability under Old and New Tax Regimes. | 11 |
| III | Introduction to E-Filing of Income Tax Returns, introduction to recent IT Forms like ITR 01(SAHAJ), ITR 02, ITR 03, ITR 04, ITR 4S (SUGAM), ITR 05 and ITR 06. Due dates of submission of return; E-Verification of ITR, Late filing fees under section 234F, Registration of PAN | 11 |
| IV | Advance payment of tax; TDS: Basic concepts , Form 16, B, C,D, E | 11 |
| V* | Practical Exposure to Income Tax: Practical Exposure to Income Tax Portal: www.incometaxindiaefiling.gov.in portal; Preparation and filing of e-return; Payment of Tax online; Generate Challans online; Viewing Tax Credit through 26AS; Reconcile Form 26AS with Form 16. | 30 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory 20**<br>Class Participation 5<br>Seminar/Presentation/Assignment/Quiz/Class Test etc. 5<br>Mid Term Exam: 10<br>➢ **Practicum 10**<br>Class Participation 5<br>Seminar/Demonstration/Viva Voce/Lab Records etc. 5<br>Mid Term Exam: | **End Term Examination:**<br>A three hour exam for both theory and practicum. |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

- Jagdish Gupta, Mukta Jain, and Rakesh Jain Gaur and Narang, Income Tax , VK Global Publications , Faridabad.
- Gaur and Narang, Income Tax Law & Practice, Kalyani Publishers, Jalandhar.
- Girish Ahuja and Ravi Gupta, Systematic Approach, C.C.H. India Publications, New Delhi.
- Mehrotra H.C., Income Tax Law & Account, Sahitya Bhawan Publications, Agra.
- Prasad, Bhagwati, Income Tax Law & Practice, Wishwan Prakashan, Bhopal.
- Singhania V.K., Student's Guide to Income Tax, Taxmann Publications Pvt. Ltd., New Delhi.

* Applicable for courses having practical component.

**GST Return Filing**

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | Commerce | | |
| Semester | IV | | |
| Name of the Course | GST Return Filing | | |
| Course Code | B23-VOC-208 | | |
| Course Type: (CC/MCC/MDC/ CCM/ SEC/VOC/DSE/PC/AEC/ VAC | VOC | | |
| Level of the course (As per Annexure-I) | 200-299 | | |
| Pre-requisite for the course (if any) | NIL | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. Understand the basic concepts of GST and composition scheme<br>2.Know about the registration under GST and valuation for GST<br>3. Understand the concepts of Tax invoice, input tax credit, RCM, E -way bills<br>4.Know about various GST returns and payment of GST | | |
| | 5*.practical knowledge about GST Return filing | | |
| | **Theory** | **Practical** | **Total** |
| Credits | 3 | 1 | 4 |
| Internal Assessment Marks | 20 | 10 | 30 |
| End Term Exam Marks | 50 | 20 | 70 |
| Exam Time | 3 Hrs. | 3 Hrs. | |

| Part-B Contents of the Course | | |
|---|---|---|
| **Instructions for Paper Setters**<br>1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprises of seven parts of 2 marks each. Question Nos. 2 to 9 will carry 09 marks each, having two questions from each unit.<br>2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Overview of GST, Taxable event; Supply & Levy of GST, Composition Scheme; Structure of tariff notification with HSN and interpretation; Classification of Services. | 12 |
| II | Time and Place of Supply; Concept of GST Registration; Valuation Rules; Concept of TDS and TCS in GST. | 11 |
| III | Tax invoice, Debit and Credit Note, Bill of Supply; Input Tax Credit; Reverse Charge Mechanism; E-way Bills & e-invoicing. | 11 |
| IV | Refunds, Returns and payment of tax; Schedule for payment of GST; Interest/penalty for late/non-filing of return. | 11 |
| V* | Practical Exposure to GST: Online GST registration demonstration, Payment of GST by electronic ledger: electronic liability register, electronic credit ledger, electronic cash ledger; Types of GST returns, Annual Return and Reconciliation Statement; Filing a refund application Generating E-way bills | 30 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory 20**<br>Class Participation 5<br>Seminar/Presentation/Assignment/Quiz/Class Test etc. 5 | | **End Term Examination:** |

| | |
|---|---|
| Mid Term Exam: 10<br>➢ **Practicum 10**<br>Class Participation 5<br>Seminar/Demonstration/Viva Voce/Lab Records etc. 5<br>Mid Term Exam: | A three hour exam for both theory and practicum. |
| **Part-C Learning Resources** | |
| **Recommended Books/E-Resources/LMS:**<br>• Datey, V.S. : GST Ready Reckoner: Taxmann Publications, New Delhi,<br>• Singhania, V.K.: Student's guide to GST & Custom Laws, Taxmann Publications, New Delhi.<br>• Goel P.K, Kishori Lal & Rastogi Pawan Kumar : Bharat GST Law Simplified , Bharat Publications<br>• Mehrotra H.C & Agarwal V. P. : Goods and Services Tax (GST) , Sahitya Bhawan Publications, Agra. | |

* Applicable for courses having practical component.

| Session 2023-2024 | | | |
|---|---|---|---|
| **Part-A Introduction** | | | |
| Subject | **Commerce** | | |
| Semester | **II** | | |
| Name of the Course | **Business Analytics** | | |
| Course Code | **B23-SEC-202** | | |
| Course Type: (CC/MCC/MDC/ CCM/ DSEC/VOC/DSE/PC/AEC/ VAC | **SEC** | | |
| Level of the course (As per Annexure-I) | 200-299 | | |
| Pre-requisite for the course (if any) | **Knowledge of Basic Excel Applications** | | |
| Course Learning Outcomes (CLO) | After completing this course, the learner will be able to:<br>1. Outline the business analytics<br>2. Examine business ecosystem of IT applications<br>3. Institute data visualization into business story telling<br>4. Application of data in Business Intelligence | | |
| | 5*.Demonstrate the concepts of BA in Excel and R | | |
| | **Theory** | **Practical** | **Total** |
| Credits | 2 | 1 | 3 |
| Internal Assessment Marks | 15 | 5 | 20 |
| End Term Examination Marks | 35 | 20 | 55 |
| Exam Time | 3 Hours | 3 Hours | |

**Part-B Contents of the Course**

**Instructions for Paper Setters**

1. The examiner will set 9 questions in all covering the course learning outcomes (CLOs). Question No. 1 will be compulsory and comprises of seven parts of 1 mark each. Question Nos. 2 to 9 will carry 7 marks each, having two questions from each unit.
2. Students are required to attempt 5 questions in all, selecting one question from each unit and the compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Understanding Business Analytics: Meaning, evolution, need, scope & types of analytics; Business analysis & Business analytics; Project Management: Meaning, aspects, phases, approaches (waterfall, agile, iterative and incremental); Challenges in business analytics; Evolving role of business analyst; Concept of big data | **8** |
| II | Business Analytics Ecosystem: Baldrige Business Excellence framework and core business processes; Purpose of using IT in business; Softwares available for business analytics; OLTP and | **7** |

| | | |
|---|---|---|
| | OLAP- introduction, concept and role of OLAP tools; Business Intelligence: meaning, need applications, common mistakes in implementation; recent Trends in BI; Excel: scope, applications, functions and formulas, what-if analysis, solver, chart & diagram, pivot tables; Overview of R: R environment, reading and writing data, statistical functions, vector, visualization | |
| III | Descriptive Analytics using Excel and R: Overview of descriptive statistics central tendency, variability; Data Visualisation: meaning, techniques: tables, cross tabulation charts, graphs, infographics, maps; Stroytelling with data; Data dashboards | **8** |
| IV | Business Analytics Applications: Applications of analytics in finance, marketing, human resource management, retail Industry, supply chain, social media,, healthcare, cyber space, transportation and logistics | **7** |
| V* | Practicum<br>Descriptive Statistical Measures in Excel & R: Basic and statistical functions: count, sum, countif, sumif, average, median, standard deviation, variance, percentile, quartile.<br>Visualizing Data: Column chart, line chart, pie chart, bar chart, thermometer chart, pareto chart, creating inforgraphics<br>Spreadsheet Modelling and Analysis using Excel :Conditional formatting- formula based, colour scales, finding duplicates; Logical Functions: IF, NOT, AND, OR; Look up & Reference Functions: Vlookup, Hlookup, Index, Match, Offset; Financial Functions: PMT, loan amortization, compound interest, CAGR, NPV, IRR, depreciation, profit margin, pivot tables, scenario manager, slicer, data tables, goal seek, advanced filters; Data validation | **30** |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>Class Participation : 4 Marks<br>Seminar/Presentation/Assignment/Quiz/Class Test etc.: 4 Marks<br>Mid Term Exam: 7 Marks<br>➢ **Practicum**<br>Class Participation: 2 Marks<br>Seminar/Demonstration/Viva Voce/Lab Records etc.: 3 Marks<br>Mid Term Exam: NA | **End Term Examination:**<br>A three hour exam each for both theory and practical |

**Part-C Learning Resources**

**Recommended Books/E-Resources/LMS:**

**Text Books:**

- Prem Sagar Jakkula, Sandeep Agarwalla, V. Karuna Sree-Business Analytics, Himalaya Publishing House, New Delhi
- RN Prasad, Seema Acharya – Fundamentals of Business Analytics, Willey
- MJ Schiniedrjans, DG Schiniedrjans, CM Starkey-Business Analytics: Principles, Concepts and Applications, Pearson India
- PH Rao- Business Analytics: An Application Focus, Prentice Hall India
- Bharti Motwani-Data Analytics with R, Wiley

**Reference/Suggested Reading**

- Anil Maheshwari, Data Analytics, Pearson
- Sandhya Kuruganti, Hindol Basu, Business Analytics: Applications to Consumer Marketing, Tata McGraw Hill
- J Liebowitz- Business Analytics: An Introduction, Auerbach Publication
- DR Hardoon, H Shmueli-Getting started with Business Analytics, CRC Press, Tylor & Francis
- G Conard, Carlberg-Business Analysis with Microsoft Excel and Power BI, Pearson

* Applicable for courses having practical component.

# SCHEME OF EXAMINATION

# &

# SYLLABI

# of

# Bachelor of Vocation in Banking, Financial Services & Insurance

*(Honours/Honours with Research)*

## As per National Education Policy 2020

***with effect from academic session 2023-24***

# Kurukshetra University, Kurukshetra

**(Established by the State Legislature Act XII of 1956)**
**(Category-I University, 'A+' Grade, NAAC Accredited)**

**website: www.kuk.ac.in**

# Abbreviations

| | |
|---|---|
| **AEC** | Ability Enhancement Course |
| **CC** | Core Course |
| **CC-H** | Core course in Honours discipline |
| **CC-HM** | Core Course in Minor Subject of of Honours Program |
| **DSE** | Discipline Specific Elective Course |
| **DSE-H** | Discipline specific elective course in Honours |
| **H** | Honours |
| **M** | Minor |
| **MDC** | Multi-Disciplinary Course |
| **PC** | Practicum Course |
| **PC-H** | Practicum Course in Honours |
| **SEC** | Skill Enhancement Course |
| **V** | Vocational |
| **VAC** | Value Added Course |

# FIRST YEAR: SEMESTER I

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-101 | Principles of Management | CC-A1 | 30 | 70 | - | 100 | **4** |
| B23-BFI-102 | Financial Institutions and Markets | CC-B1 | 30 | 70 | - | 100 | **4** |
| B23-BFI-103 | Banking Laws and Practice | CC-C1 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of minor courses for Semester I | CC-M1 | 15 | 35 | - | 50 | **2** |
| | Each student will opt one multidisciplinary course from the discipline which is different from the discipline of business administration | MDC-1 | | | | 75 | **3** |
| | Each student will opt one course from pool of ability enhancement courses provided by university | AEC-1 | | | | 50 | **2** |
| | Each student will opt one course from pool of skill enhancement courses provided by university | SEC-1 | | | | 75 | **3** |
| | Each student will opt one course from pool of value added courses provided by university | VAC-1 | | | | 50 | **2** |
| **Total** | | | | | | **600** | **24** |

## POOL OF MINOR COURSES FOR SEMESTER I

| Course code | Nomenclature of Minor Course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-104 | Business Mathematics-I | CC-M1 | 15 | 35 | - | 50 | **2** |

## FIRST YEAR: SEMESTER II

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical/ Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-201 | Financial Accounting | CC-A2 | 30 | 70 | - | 100 | **4** |
| B23-BFI-202 | Insurance Laws and Practice | CC-B2 | 30 | 70 | - | 100 | **4** |
| B23-BFI-203 | Fundamentals of Insurance and Operations | CC-C2 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of minor courses for Semester II | CC-M2 | 15 | 35 | - | 50 | **2** |
| | Each student will opt one multidisciplinary course from the discipline which is different from the discipline of business administration | MDC-2 | | | | 75 | **3** |
| | Each student will opt one course from pool of ability enhancement courses provided by university | AEC-2 | | | | 50 | **2** |
| | Each student will opt one course from pool of skill enhancement courses provided by university | SEC-2 | | | | 75 | **3** |
| | Each student will opt one course from pool of value added courses provided by university | VAC-2 | | | | 50 | **2** |
| **Total** | | | | | | **600** | **24** |

## POOL OF MINOR COURSES FOR SEMESTER II

| Course code | Nomenclature of Minor Course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-204 | Business Mathematics-II | CC-M2 | 15 | 35 | - | 50 | **2** |

**Exit Option:** Any student opting for exit option after first year will get **Undergraduate Certificate in Banking, Financial Services & Insurance** provided he/she completes 48 Credits of first two semesters and additional 4 credits of summer training report (100 External Marks) based on summer training of 4-6 weeks undertaken in a business organization. Thus, he/she will be eligible to exit the course with the said 52 Credits. In addition, the summer internship report will be evaluated by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra. Furthermore, the credits of summer internship report will be included/mention in the **Undergraduate Certificate in Banking, Financial Services & Insurance** as follows:

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-205 | Summer Internship Report | Internship | - | 100* | - | 100 | **4** |

*The summer internship report will be evaluated by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

## SECOND YEAR: SEMESTER III

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-301 | Accounting for Banking and Insurance Companies | CC-A3 | 30 | 70 | - | 100 | **4** |
| B23-BFI-302 | Mutual Fund Operations | CC-B3 | 30 | 70 | - | 100 | **4** |
| B23-BFI-303 | Digital-Banking | CC-C3 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of minor courses for Semester III | CC-M3 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one multidisciplinary course from the discipline which is different from the discipline of business administration | MDC-3 | | | | 75 | **3** |
| | Each student will opt one course from pool of ability enhancement courses provided by university | AEC-3 | | | | 50 | **2** |
| | Each student will opt one course from pool of skill enhancement courses provided by university | SEC-3 | | | | 75 | **3** |
| **Total** | | | | | | **600** | **24** |

## POOL OF MINOR COURSES FOR SEMESTER III

| Course code | Nomenclature of Minor Course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-304 | Managerial Economics | CC-M3 | 30 | 70 | - | 100 | **4** |
| B23-BFI-305 | Organisational Behaviour | CC-M3 | 30 | 70 | - | 100 | **4** |

## SECOND YEAR: SEMESTER IV

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-401 | Business Statistics | CC-A4 | 30 | 70 | - | 100 | **4** |
| B23-BFI-402 | Life Insurance Operations | CC-B4 | 30 | 70 | - | 100 | **4** |
| B23-BFI-403 | Business Banking and Operations | CC-C4 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of vocational courses provided by university | CC-M4 (V1) | | | | 100 | **4** |
| | Each student will opt one course from pool of ability enhancement courses provided by university | AEC-4 | | | | 50 | **2** |
| | Each student will opt one course from pool of value added courses provided by university | VAC-3 | | | | 50 | **2** |
| **Total** | | | | | | **500** | **20** |

**Exit Option:** Any student opting for exit option after second year will get **Undergraduate Diploma in Banking, Financial Services & Insurance** provided he/she completes 92 credits of first four semesters and additional 4 credits of summer training report (100 external marks) based on summer training of 4-6 weeks in a business organization undertaken after completion of second semester or fourth semester. Thus, he/she will be eligible to exit the course with the said 96 Credits. In addition, the summer internship report will be evaluated by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra. Furthermore, the credits of summer internship report will be included/mention in the **Undergraduate Diploma in Banking, Financial Services & Insurance** as follows:

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-404 | Summer Internship Report | Internship | - | 100* | - | 100 | **4** |

*The summer internship report will be evaluated by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

**Note:** The student seeking admission in fifth semester will have to undergo a compulsory 4-6 weeks summer internship in a business organization after fourth semester and credits for the same will be included in fifth semester.

## THIRD YEAR: SEMESTER V

| Course code | Nomenclature of the paper | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-501 | Analysis of Financial Statements | CC-A5 | 30 | 70 | - | 100 | **4** |
| B23-BFI-502 | Operations of NBFCs | CC-B5 | 30 | 70 | - | 100 | **4** |
| B23-BFI-503 | Financial Services | CC-C5 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of vocational courses provided by university | CC-M5 (V2) | | | | 100 | **4** |
| B23-BFI-504 | Summer Internship Report | Internship | - | 100* | - | 100 | **4** |
| **Total** | | | | | | **500** | **20** |

***The summer internship report will be evaluated by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

## THIRD YEAR: SEMESTER VI

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-601 | Depository Institutions | CC-A6 | 30 | 70 | - | 100 | **4** |
| B23-BFI-602 | Financial Management | CC-B6 | 30 | 70 | - | 100 | **4** |
| B23-BFI-603 | Comprehensive Viva-Voce | CC-C6 | - | - | 100* | 100 | **4** |
| | Each student will opt one course from pool of minor courses for Semester VI | CC-M6 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of vocational courses provided by university | CC-M7 (V3) | | | | 100 | **4** |
| **Total** | | | | | | **500** | **20** |

## POOL OF MINOR COURSES FOR SEMESTER VI

| Course code | Nomenclature of Minor Course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-604 | Entrepreneurship | CC-M6 | 30 | 70 | - | 100 | **4** |
| B23-BFI-605 | Digital-Commerce | CC-M6 | 30 | 70 | - | 100 | **4** |

*****Comprehensive viva-voce will be conducted by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

**Exit option:** Any student who exit after 6 semesters must complete 132 credits and he/she will be awarded with **Bachelor of Vocation in Banking, Financial Services & Insurance.**

**Notes:**

1. A student will opt for Multidisciplinary Course (MDC) from the subject which is different from the discipline of Business Administration/Business Management. Students are not allowed to choose or repeat courses already undergone at the higher secondary level (12th class) or opted as major and minor courses under this category. Provided further that if a Multidisciplinary Course across the discipline cannot be offered by the Department/Institute/College, due to its constraints and available resources, then
   i. MDC can be opted out of MOOCs through SWAYAM.
   ii. MDC can be completed out of online courses offered by the Kurukshetra University, Kurukshetra.
   iii. MDC can be completed from a cluster college, i.e., from a neighboring college/institute.
2. 4-year Bachelor of Vocation in Banking, Financial Services & Insurance (Honours/Honours with Research) will be offered after completion of 3 year Bachelor of Vocation in Banking, Financial Services & Insurance programme to those students who have completed at least 60 credits in the concerned discipline. In addition to the above, 4-year Bachelor of Vocation in Banking, Financial Services & Insurance (Honours with Research) will be offered only to those students who have obtained CGPA 7.5 or more in the 3 year Bachelor of Vocation in Banking, Financial Services & Insurance programme.
3. Bachelor of Vocation in Banking, Financial Services & Insurance (Honours/Honours with Research) will be awarded after successful completion of the four year programme securing 180 credits.
4. Student opting for Honours with Research will work on a Research Project or do research during the eighth semester. The research project work will be of 12 credits. 8 credits will be earmarked for the evaluation report of the research project and viva-voce examination for the same will carry weightage of 4 credits.

# Bachelor of Vocation in Banking, Financial Services & Insurance (Honour)

## Fourth Year: Semester VII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-701 | Risk Management | CC-H1 | 30 | 70 | - | 100 | **4** |
| B23-BFI-702 | Security Market Operations | CC-H2 | 30 | 70 | - | 100 | **4** |
| B23-BFI-703 | Retail Banking and Operations | CC-H3 | 30 | 70 | - | 100 | **4** |
| | Each student will opt one course from pool of discipline specific elective courses for Semester VII | DSE-H1 | 30 | 70 | - | 100 | **4** |
| B23-BFI-706 | Seminar | PC-H1 | - | - | 100* | 100 | 4 |
| B23-BFI-707 | Financial Technology in Banking Sector | CC-HM1 | 30 | 70 | - | 100 | **4** |
| **Total** | | | | | | **600** | **24** |

### POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-704 | Currency Flows and FPI Investments | DSE-H1 | 30 | 70 | - | 100 | **4** |
| B23-BFI-705 | Business Analytics | DSE-H1 | 30 | 70 | - | 100 | **4** |

*Seminar will be assessed by a presentation based on relevant topic assigned to the student by the institute/college and evaluation of the same will be done by the a two members committee comprising of an external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra and Head of Department (or his/her nominee) in concerned college/institute.

## Fourth Year: Semester VIII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-801 | Investment Management | CC-H4 | 30 | 70 | - | 100 | 4 |
| B23-BFI-802 | Financial Planning and Wealth Management | CC-H5 | 30 | 70 | - | 100 | 4 |
| B23-BFI-803 | Micro Finance Operations | CC-H6 | 30 | 70 | - | 100 | 4 |
| | Each student will opt one course from pool of discipline specific elective courses for Semester VIII | DSEH2 | 30 | 70 | - | 100 | 4 |
| B23-BFI-805 | Venture Capital Financing | PC-H2 | 30 | 70 | - | 100 | 4 |
| B23-BFI-806 | Comprehensive Viva-Voce | CC-HM2 | - | - | 100* | 100 | 4 |
| **Total** | | | | | | **600** | **24** |

### POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VIII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-804 | International Banking | DSE-H2 | 30 | 70 | - | 100 | 4 |

*Comprehensive viva-voce will be conducted by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

**Note:** Student completing 180 credits will be eligible to obtain **Bachelor of Vocation in Banking, Financial Services & Insurance (Honours).**

# Bachelor of Vocation in Banking, Financial Services & Insurance (Honours with Research)

## Fourth Year: Semester VII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-701 | Risk Management | CC-H1 | 30 | 70 | - | 100 | 4 |
| B23-BFI-702 | Security Market Operations | CC-H2 | 30 | 70 | - | 100 | 4 |
| B23-BFI-703 | Retail Banking and Operations | CC-H3 | 30 | 70 | - | 100 | 4 |
| | Each student will opt one course from pool of discipline specific elective courses for Semester VII | DSE-H1 | 30 | 70 | - | 100 | 4 |
| B23-BFI-706 | Seminar | PC-H1 | - | - | 100* | 100 | 4 |
| B23-BFI-707 | Financial Technology in Banking Sector | CC-HM1 | 30 | 70 | - | 100 | 4 |
| **Total** | | | | | | **600** | **24** |

### POOL OF DISCIPLINE SPECIFIC ELECTIVE COURSES FOR SEMESTER VII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical /Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-704 | Currency Flows and FPI Investments | DSE-H1 | 30 | 70 | - | 100 | 4 |
| B23-BFI-705 | Business Analytics | DSE-H1 | 30 | 70 | - | 100 | 4 |

*Seminar will be assessed by a presentation based on relevant topic assigned to the student by the institute/college and evaluation of the same will be done by the a two members committee comprising of an external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra and Head of Department (or his/her nominee) in concerned college/institute.

## Fourth Year: Semester VIII

| Course code | Nomenclature of the course | Category | Internal Marks | External Marks | Practical/ Viva-Voce Marks | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| B23-BFI-801 | Investment Management | CC-H4 | 30 | 70 | - | 100 | **4** |
| B23-BFI-802 | Financial Planning and Wealth Management | CC-H5 | 30 | 70 | - | 100 | **4** |
| B23-BFI-806 | Comprehensive Viva-Voce | CC-HM2 | - | - | 100* | 100 | **4** |
| B23-BFI-807 | Research Project | Project/ Dissertation | 0 | 200** | 100*** | 300 | **8+4 =12** |
| **Total** | | | | | | **600** | **24** |

*****Comprehensive viva-voce will be conducted by external expert from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

******Project Report will be evaluated by external examiner from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

*******Viva-Voce on Project Report will be conducted by External Examiner from panel approved by UGBOS of University School of Management, Kurukshetra University, Kurukshetra.

**Note:** Students completing 180 credits will be eligible to obtain **Bachelor of Vocation in Banking, Financial Services & Insurance (Honours with Research).**

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking, Financial Services & Insurance** | | |
| Semester | **I** | | |
| Name of the Course | **Principles of Management** | | |
| Course Code | **B23-BFI-101** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-A1** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the Nature and Evolution of Management.<br>2. Apply the Managerial skills and roles at workplace.<br>3. Apprehend the functions of Management<br>4. Recognize the latest changes in the field of Management. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Management: Concept, Evolution of Management Thought, Functions, Significance, Managerial Roles & Skills; Planning and Decision Making: Concept, Planning Process, Components of Plans. | 15 |
| II | Organizing: Concept, Guiding Principles; Types of organizational structure: Line, Functional, Line & Staff Relationship; Delegation of Authority: Meaning and Elements of Delegation; Centralization Vs Decentralization. | 15 |
| III | Staffing – Meaning, Nature, Importance, Process; Directing: Elements, Principles and Importance. | 15 |
| IV | Communication: Meaning, Process, Barriers, Corrective Measures; Communication networks; Controlling: Concept, Importance, Process of controlling, Control Techniques. | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: **5**<br>• Seminar/presentation/assignment/quiz/class test etc.: **10**<br>• Mid-Term Exam: **15** | End Term Examination: **70** | |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br><br>1. Koontz & Weirich. *Essentials of Management.* Tata McGraw Hill.<br>2. Kaul Vijay Kumar. *Business Organization & Management – Text and Cases*. Pearson.<br>3. Robbins. *Fundamentals of Management: Essentials Concept and Applications.* Pearson Education. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking, Financial Services & Insurance** | | |
| Semester | **I** | | |
| Name of the Course | **Financial Institutions and Markets** | | |
| Course Code | **B23-BFI-102** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-B1** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the concepts relevant to Indian financial markets and financial institutions.<br>2. Understand the role and importance of Indian financial market.<br>3. Understand the recent developments in commercial banking in India.<br>4. Understand the role of SEBI and RBI in financial market. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction: Nature and role of financial system; financial system and economic development; An overview of Indian financial system. | 15 |
| II | Components of financial system: Financial markets and financial instruments; Money market: meaning, constituents, instruments and functions; capital market: primary and secondary market; recent development in Indian money and capital market; depository system; Government securities market in India. | 15 |
| III | Development Banks: Concept, objectives and functions of development banks; Recent developments in development banking; Commercial Banks: meaning, functions, structure and recent developments in commercial banking in India; Digital Banking, UPI and payment banks. | 15 |
| IV | SEBI: Role, power and recent developments; Reserve Bank of India: History, organization, management and functions; Credit creation and credit control, Monetary Policy of Inflation Targeting. | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br><br>1. Averbach, Robert D: Money, Banking and Financial Markets; MacMillan, London.<br>2. Bhole, L.M: Financial Markets and Institutions, Tata McGraw Hill, Delhi.<br>3. Khan, M.Y: Indian Financial System, Tata McGraw Hill, Delhi.<br>4. Varshney, P.N: Indian Financial System, Sultan Chand & Sons, New Delhi. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking, Financial Services & Insurance** | | |
| Semester | **I** | | |
| Name of the Course | **Banking Laws & Practice** | | |
| Course Code | **B23-BFI-103** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-C1** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the regulatory framework related to banks.<br>2. Understand relationship of bank with its customers.<br>3. Understand advances and loans offered by banks.<br>4. Understand electronic fund management system in banking industry. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Regulatory Framework and Compliances: RBI Act 1934, Banking Regulation Act 1949, Monetary and Credit Policy, Prevention of Money Laundering Act 2002, Banking Codes and Standard Board of India. Negotiable Instruments Act 1881: Negotiable Instrument, Types of Negotiable Instruments, Parties to Negotiable Instruments, Negotiation of Negotiable Instrument. | 15 |
| II | Banker and Customer: Definition of customer, banker and customer relationship, Obligation of a banker, Duty of confidentiality, Insurance of Bank Deposits. Legal aspects of banking operations : Legal aspects of a cheque, legal aspects of a paying banker, legal aspects of collection of a cheque, indemnities, guarantees, operations in deposit accounts, complaints of customers. | 15 |
| III | Loans and Advances: Principles of lending credit worthiness of borrowers, types of credit facilities, priority sector advances, Credit Linked Government sponsored schemes: Kisan Credit Card Schemes, Financing SHGs, Financing Joint Liability Groups (JLGs), Trade Finance, export- import finance. Securities for Bank Loans. | 15 |
| IV | Electronic Fund Management System: ATM, RTGS, NEFT, CBS, ECS, CTS; credit and debit cards, smart cards, electronic fund transfer system, electronic commerce and banking. Banking Related Laws: Limitation Act 1963, Bankers' Book Evidence Act 1891, Lenders Liability Act, Banking Ombudsman, SARFAESI Act 2002, Lok Adalats, Recovery of debtors due to banks and Financial Institutions Act ,1993 (DRT Act). | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>1. Banking Theory: Law & Practice: K P M Sundram and V L Varsheney, Sultan Chand & Sons.<br>2. Banking Theory: Law & Practice: B Santhanam: Margam Publications.<br>3. Banking Theory & Practice, Seven Hills International Publishers, Hyderabad. |

| Part A - Introduction | | | |
|---|---|---|---|
| Subject | **Banking, Financial Services & Insurance** | | |
| Semester | **I** | | |
| Name of the Course | **Business Mathematics-I** | | |
| Course Code | **B23-BFI-104** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-M1** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand set theory, logical statements and truth table. Find the solution of linear equations.<br>2. Determine the solution of quadratic equations. Learn the concept and applications of permutations and combinations.<br>3. Apply binomial theorem. Understand the concepts related to functions, limits and continuity.<br>4. Understand the matrix algebra and its application to business problems. Find the solution of system of simultaneous linear equations using determinants and matrices. | | |
| Credits | Theory | Practical | Total |
| | **2** | **0** | **2** |
| Contact Hours/Week | **2** | **0** | **2** |
| Max. Marks: **50**<br>Internal Assessment Marks: **15**<br>End Term Exam Marks: **35** | | Time: **3 Hours** | |

## Part B - Contents of the Course

**Instructions for Paper- Setter**

The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 1.75 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 7 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Set Theory: Representation of sets, equivalent sets, power set, complement of a set. Venn Diagrams: Union and Intersection of sets, De-Morgan's laws. | 8 |
| II | Quadratic Equations with real roots: Relations between roots and coefficient of the quadratic equations , Methods of solving a quadratic equation | 8 |
| III | Binomial Theorem (positive index), Functions, Limits and Continuity. | 7 |
| IV | Matrix System: Matrices, Basic operations on matrices (Addition, Multiplication, Transpose), Determinant of a square matrix, Inverse of a square matrix, Cramer's rule | 7 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **4**<br>● Seminar/presentation/assignment/quiz/class test etc.: **4**<br>● Mid-Term Exam: **7** | End Term Examination: **35** |

## Part C-Learning Resources

**Recommended Books/e-resources/LMS:**


1. Dr. Sancheti & Kapoor: *Business Mathematics and Statistics*; Sultan Chand.
2. R.S. Bhardwaj: *Mathematics for Economics & Business*; Excel Books, India.
3. M. Raghavachari: *Mathematics for Management: An Introduction*; Tata McGraw Hills.
4. Azharuddin: *Business Mathematics*; Vikas Publishers.
5. Gorakh Prasad: *Differential Calculus*; Rashi Kansal (Pothishala).
6. G. Rangaraj, R. Mallieswari & V. Rema: *Business Mathematics*; Cengage.
7. Eugene Don, Joel Lerner: *Schaum's Outline of Basic Business Mathematics (Schaum's Outlines)*; McGraw-Hill Education.

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking, Financial Services & Insurance** | | |
| Semester | **II** | | |
| Name of the Course | **Financial Accounting** | | |
| Course Code | **B23-BFI-201** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-A2** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the accounting equations and the rules of recording accounting transactions.<br>2. Understand the recording of accounting transactions in the books of entry and the preparation of ledger accounts.<br>3. Understand the preparation of trial balance and reconciliation of accounting statements.<br>4. Analyze accounting transactions by preparing final accounts of statements for the profit and non-profit business entities. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Unit Basic Accounting-Nature, scope and objectives of accounting: accounting as information system, users of accounting information. Accounting equation: Accounting concepts and conventions, capital and revenue expenditure; Accounting principles, rules of accounting for recording the transaction for different accounts. | 15 |
| II | Journal and Ledger: Double Entry System; Journal and recording of entries in journal; Ledger- Posting from Journal to respective ledger accounts. Preparation of Cash book. | 15 |
| III | Trial Balance: Need and objectives; Preparation of Trial Balance; Different types of errors in preparation of trial balance and the rectification of errors. Preparation of Bank Reconciliation statement. | 15 |
| IV | Final Accounts: Preparation of Trading Account and Profit and Loss Account; Receipts and payments account, Preparation of Balance sheet for profit and non-profit organizations. | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br><br>2. Gupta R. L.; *Advanced Accounting*; S. Chand & Sons.<br>2. Grewal T. S and M.C. Shukla; *Advanced Accounting;* S. Chand & Sons.<br>3. Williams, Haka, Bettner & Carcello; *Financial and Managerial Accounting;* McGraw Hill |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking Financial Services & Insurance** | | |
| Semester | **II** | | |
| Name of the Course | **Insurance Laws & Practice** | | |
| Course Code | **B23-BFI-202** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-B2** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the basics of Insurance.<br>2. Understand the nature and need for insurance.<br>3. Understand about various types of Insurance<br>4. Better understanding of Legal & Regulatory aspects of Insurance. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Insurance Evolution & meaning of Insurance, need for insurance, nature, functions of insurance, Scope of insurance, role in economic development. Principles of Insurance: Basic Principles. | 15 |
| II | Contract of Insurance: Types of Insurance contract, condition necessary for contract, Insurance documents: Proposal form, policy form, cover notes, certificate of insurance, endorsements, concept of partial insurance. Insurance Legislation and IRDA: The Insurance act 1938, salient features of IRDA Act, Role and function of IRDA. | 15 |
| III | Life Insurance: Application of Principles in life insurance contract, Representation, Assignment and nomination, Tax law implications Stamp duties, role and functions of life insurance companies. | 15 |
| IV | General Insurance: Application of Principles in General Insurance contracts, structure of the Policy, Insurance Documentation, Underwriting and Rating, Claims Procedures, Underinsurance, condition of Average, Salvage. | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** | |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>**1.** M.N. Srinivasan : Principles of Insurance Law, Wadhwa & Co.<br>**2.** Rajiv Jain : Insurance Law and Practice, Vidhi Publication Private Limited<br>**3.** Taxmann : Insurance Manual, Taxmann Publication Private Limited |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking Financial Services & Insurance** | | |
| Semester | **II** | | |
| Name of the Course | **Fundamentals of Insurance & Operations** | | |
| Course Code | **B23-BFI-203** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-C2** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the basics of Insurance.<br>2. Learn about various types of Insurance.<br>3. Understand the principles and regulations of Insurance.<br>4. Understand the role of Insurance in developing economies like India. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction: Need of security against economic difficulties, Risk and uncertainty; Social security and insurance. Definition, nature and function of insurance, Insurance V/s Investment, Evolution of insurance, Types of insurance. | 15 |
| II | Insurance Contract: General and Specific Principles of Insurance. Brief history of Insurance industry in India; Enactment of Insurance Act, 1938. Nationalization of Life Insurance Companies in1955. Nationalization of General Insurance Companies in1972. Malhotra Committee Report – Opening up of Insurance sector to Private Companies in 2000. | 15 |
| III | Objective of Setting up of Insurance Regulatory and Development Authority in 1999. IRDA Act 1999 – Organization, guidelines for life & Non-life insurance. Growth of insurance in India; Role of Insurance in Developing economies like India. | 15 |
| IV | Types of Life Insurance policies/products in India. Classification of General insurance: Fire insurance, Marine insurance, Social insurance, Personal insurance, Motor insurance, and miscellaneous insurance. Claim settlement procedure in insurance. Distribution channels in insurance industry: qualifications, remunerations, role, and code of conduct. | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>1. Huebner S.S. and Kennerth Black Jr.:Life Insurance (Prentice Hall Inc.)<br>2. Meher Robert, L. : Life Insurance; Theory and Practice; Business Publications, Texas.<br>3. Neelam C. Gulati, 'Principles of Insurance Management', Excel Books,2007 |

| Part A - Introduction | | | |
|---|---|---|---|
| Subject | **Banking Financial Services & Insurance** | | |
| Semester | **II** | | |
| Name of the Course | **Business Mathematics-II** | | |
| Course Code | **B23-BFI-204** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-M2** | | |
| Level of the course (As per Annexure-I | **Foundation-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the application of Average, Ratio and Proportion, Percentage, Profit and Loss, Commission, Discount, Broke in business organisation.<br>2. Understand simple interest and compound interest and annuities.<br>3. Understand indices & logarithms.<br>4. Understand aapplications of linear programming in solving business problems. | | |
| Credits | Theory | Practical | Total |
| | **2** | **0** | **2** |
| Contact Hours/Week | **2** | **0** | **2** |
| Max. Marks: **50**<br>Internal Assessment Marks: **15**<br>End Term Exam Marks: **35** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 1.75 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 7 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Average, Ratio and Proportion, Percentage, Profit and Loss, Commission, Discount, Broke. | 8 |
| II | Simple interest and compound interest. Annuities: Types of annuities, Present value and amount of an annuity (including the case of continuous compounding), Valuation of simple loans and debentures, Problems related to sinking funds. | 8 |
| III | Indices & logarithms, arithmetic and geometric progressions and their business applications; sum of first n natural numbers, sum of squares and cubes of first n natural numbers. | 7 |
| IV | Linear Programming: Formulation of linear programming problems (LPP) and their solution by graphical and simplex methods. Applications of linear programming in solving business problems. | 7 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **4**<br>● Seminar/presentation/assignment/quiz/class test etc.: **4**<br>● Mid-Term Exam: **7** | End Term Examination: **35** | |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>1. E. Don and J. Lerner (2009). Schaum's outline of Basic Business Mathematics (2nd Edition). McGraw Hill.<br>2. L.N.Paul (2002). Linear Programming: an introductory analysis. Tata Mcgraw Hill. New. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking Financial Services & Insurance** | | |
| Semester | **III** | | |
| Name of the Course | **Accounting for Banking & Insurance Companies** | | |
| Course Code | **B23-BFI-301** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-A3** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the basics of banking & Insurance.<br>2. Prepare final accounts in Banking Companies.<br>3. Better Understanding of Life Insurance Company Accounts.<br>4. Learn how the books of accounts are prepared in general insurance companies. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

## Part B- Contents of the Course

**Instructions for Paper- Setter**

The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Banking: legal definition of banking; types of banks operating in India. Banking Business: model and accounting**.** The provisions relating to capital, reserve, liquidity norms (Capital Reserve Ratio & Statutory Liquidity Ratio). | 15 |
| II | Main Characteristics of a Bank's Book-Keeping System; Preparation and analysis of Books of Accounts; Analysis of balance sheet of a banking company. | 15 |
| III | Insurance- Various Types of Insurance; basis of insurance premium, considerations for annuities granted, claims, surrender value, bonus, paid-up policy, re-insurance and agents balances. | 15 |
| IV | Computation of "premium income", "claims expense" and "commission expense" in the case of an insurance company; Preparation and analysis of books of Accounts of life insurance and general insurance business. | 15 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** |

## Part C-Learning Resources

**Recommended Books/e-resources/LMS:**

1. NaliniPraveTripathy, Prabir Pal, 'Insurance theory and practice' TMH 2007.
2. Justin Paul and Padmalatha Suresh, 'Management of Banking and financial services' TMH 2009.
3. M. RavathySriram and P.K. Bamanan, 'Core banking solution' PHI 2008
4. Jyotsna Sethi and Nishevan Bhatia, 'Elements of Banking and Insurance' PHI 2008.

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking Financial Services & Insurance** | | |
| Semester | **III** | | |
| Name of the Course | **Mutual Fund Operations** | | |
| Course Code | **B23-BFI-302** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-B3** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the fundamental concepts of mutual funds.<br>2. Understand the structure and constituents of mutual funds.<br>3. Understand the various types of mutual fund products.<br>4. Understand the role played by SEBI in mutual fund operations. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

## Part B- Contents of the Course

**Instructions for Paper- Setter**

The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Mutual Funds- Introduction to Mutual Funds, Structure and Constituents of Mutual Funds, Types of Mutual Funds, Factors Affecting Mutual Fund Performance. | 15 |
| II | Mutual Fund Products, Products Similar to Mutual Funds-ULIP, Mutual Fund Vs. Shares, Mutual Fund Vs. Bank Deposits, Types of Risk associated with Mutual Fund. | 15 |
| III | Market Research- Determining Top Performing Funds, Analysing the Features of Top Performing Mutual Funds and Factors affecting them, Documentation Required, Applicable NAV and Cut-Off Time. | 15 |
| IV | Mutual Fund Industry - Growth, prospects and hurdles, SEBI's Role and Relevant Regulations related to Mutual fund, Investor Right's and Protection. | 15 |

**Suggested Evaluation Methods**

| Internal Assessment: | |
|---|---|
| ➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** |

## Part C-Learning Resources

**Recommended Books/e-resources/LMS:**


1. The Rise of Mutual Funds: An Insider's View, By Matthew P. Fink Oxford University Press, 2008
2. Common Sense On Mutual Funds, John C. Boglewiley, 2010
3. Scientific Investment Analysis, Austin Murphy Quorum Books, 2000 (2nd Edition)
4. Mutual Fund Performance During Up And Down Market Conditionsby Rao, S. P. Uma Maheswar Review of Business, Vol. 22, No. 1, Spring 2001
5. Frank J. Fabozzi, *Bond Markets Analysis & Strategies*, Pearson

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking Financial Services & Insurance** | | |
| Semester | **III** | | |
| Name of the Course | **Digital Banking** | | |
| Course Code | **B23-BFI-303** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-C3** | | |
| Level of the course (As per Annexure-I) | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the digital banking with its channels.<br>2. Understand the different cards offered by banks to its customers and ATMs.<br>3. Understand the branchless banking in modern times.<br>4. Understand the domestic and global financial payment systems. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Digital Banking: Overview, Need and Importance, Channels of Digital Banking. Digital Banking Products: Introduction and need for Digital Banking Products. Mobile Banking: Overview of Mobile Banking, Product features & diversity of Mobile Banking, Immediate Payment Service (IMPS), Risk Management & Frauds related to Mobile Banking, Benefits of providing Mobile Banking Services. | 15 |
| II | Cards: Overview & brief history of cards and various types of cards a bank provides to its customers. EMV Technology: New Technologies such as Tap and Go, NFC etc., Approval Processes for the issue of Cards, Benefits of Cards, Recovery & Follow-Ups for Cards. ATMs: Overview and brief history of ATMs, Product features, Instant Money Transfer Systems, Proprietary, Brown Label, and White Label ATMs, various Value-Added Services (e.g., bill payments, donations, etc.), ATM Network Planning such as Onsite & Offsite, Security & Surveillance of ATM sites, Benefits of installing ATMs, Risk Management and Frauds related to ATMs | 15 |
| III | Internet Banking: Overview of Internet Banking, its products and their features, Corporate and Individual Internet Banking integration with e-Commerce Merchants, etc., Types of Risks associated with Internet Banking, Technology and Security Standards for Internet Banking. Branchless Banking: Objectives of running Branchless Banking. | 15 |
| IV | Cash Deposit Machines: Overview and brief history of CDM, CDM Network Planning such as Onsite or Offsite, Benefits of CDMs, Risk Management and Fraud. Payment Systems: Overview of Global and Domestic Payment Systems, RuPay & RuPay Secure. Immediate Payment Service – IMPS, National Unified USSD Platform i.e NUUP, RTGS, NEFT. National Automated Clearing House (NACH), Aadhaar Enabled Payment System (AEPS) e-KYC, Cheque Truncation System or CTS, National Financial Switch (NFS). | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>1. C.S. Rayudu (2015). E-Business. Himalaya Publishing House.<br>2. Indian Institute of Banking and Finance. Digital Banking. Taxmann. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking Financial Services & Insurance** | | |
| Semester | **III** | | |
| Name of the Course | **Managerial Economics** | | |
| Course Code | **B23-BFI-304** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-M3** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the nature and scope of managerial economics and identify the role of economics in decision making.<br>2. Understand theory of demand, law of demand and cardinal utility analysis.<br>3. Understand theory of production, costs, and revenue function.<br>4. Understand theory of firm and market organization including determination of price under different market Conditions. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Managerial Economics: Meaning, Nature and Scope. Objectives of the firm, Equilibrium, Utility, Opportunity cost, Marginal and Incremental Principles. | 15 |
| II | Theory of Demand: Nature of demand for a product, individual demand, market demand, determinants of demand, Law of demand, Elasticity of demand and its determinants; Theory of Consumer Behavior: Cardinal utility analysis, Indifference curve analysis, applications of Indifference curves. | 15 |
| III | Theory of Production and Costs: The concept of Production function, production with one and two variable inputs, theory of Cost in short run and long run, Revenue function. | 15 |
| IV | Theory of firm and market organization: Pricing under Perfect Competition, Pricing under Monopoly, Price Discrimination, Pricing under Monopolistic Competition, Selling cost, Pricing under Oligopoly. | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>1. Koutsoyiannis, A.: *Modern Microeconomics*; Palgrave Macmillan.<br>2. Varshney, R. L. and Maheshwari, K. L.: *Managerial Economics*; Sultan Chand & Sons.<br>3. Mote, V., Paul, S., and Gupta, G.: *Managerial Economics*; McGraw Hill Education. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking, Financial Services & Insurance** | | |
| Semester | **III** | | |
| Name of the Course | **Organisational Behaviour** | | |
| Course Code | **B23-BFI-305** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-M3** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br><br>1. Understand the Nature, Evolution of Organisational Behaviour.<br>2. Understand the process of group formation and role of Groups at workplace.<br>3. Discover and Understand the concept of Motivation and Leadership theories<br>4. Comprehend the latest changes happening in the field of Organisational Behaviour. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Organizational Behaviour: Definition, Fundamental concepts of OB, Historical Background. | 15 |
| II | Motivation: Definition, Importance, Motives, Characteristics, Content Theories of Motivation. Morale - Definition and relationship with productivity, Morale Indicators. | 15 |
| III | Theories of Leadership - Trait Theory, Behavioural theories, Contingency Theories, Transactional Theories and Transformational Leadership Theory. | 15 |
| IV | Group Dynamics and Team building: Concept of Group & Team. Theories of Group Formation – Types of Groups. Importance of Team building at workplace. | 15 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** | |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br><br>1. Robbins, S. P. and Sanghi. *Organizational Behaviour.* Pearson Education.<br>2. Robbins, S. P. and Judge T. A. Vohra; *Organisational Behaviour.* Pearson Education. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking Financial Services & Insurance** | | |
| Semester | **IV** | | |
| Name of the Course | **Business Statistics** | | |
| Course Code | **B23-BFI-401** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-A4** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br><br>1. Understand the meaning of the statistics and data in everyday life and its presentation for business decision making.<br>2. Understand distinctive features and characteristics of data with the help of descriptive and summary statistical measures.<br>3. Understand and analyses the departure from statistical normality of data for better business decision making.<br>4. Understand the significance of sampling in the statistical data collection and applications in business decision making. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Business Statistics: Introduction, Scope, Functions, Importance, Limitations; Distrust of Statistics; Collection of Primary and Secondary data; Types of Statistical Methods; Data Analysis and Interpretation; Graph: Characteristics, Types, Merits and Demerits. | 15 |
| II | Measures of Central Tendency: Meaning, Types; Arithmetic Mean; Geometric Mean; Harmonic Mean; Quadratic Mean; Moving Average; Progressive Average; Relation between Mean, Median and mode. | 15 |
| III | Measures of Dispersion and Skewness: Absolute and Relative measures of Dispersion range, Quartile deviation, Mean and Standard Deviation; Difference between Skewness and Dispersion, Empirical relation among various measures of Dispersion, Moments and Kurtosis. | 15 |
| IV | Sampling: Introduction, Census versus Sample, Errors in Sampling, Types of sampling, Judging reliability of sample; Index numbers: Introduction, Types of Index Numbers, Methods of constructing Index numbers, uses of Index numbers; Time Series analysis: Components and Seasonality analysis. | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br><br>1. D. N Elhance, Veena Elhance & BM Aggarwal. *Fundamentals of Statistics*. Kitab Mahal.<br>2. T.N Srivastava and Shailaja Rego. *Statistics for Management*. McGraw Hill.<br>3. S.C Gupta. *Fundamental of Statistics*. Himalaya Publishing House.<br>4. Levine & Rubin. *Statistics for Management*. Pearson Publication.<br>5. S.P Gupta. *Statistical Methods*. Sultan Chand & Sons. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking Financial Services & Insurance** | | |
| Semester | **IV** | | |
| Name of the Course | **Life Insurance Operations** | | |
| Course Code | **B23-BFI-402** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-B4** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the nature and uses of life insurance.<br>2. Understand types of Life Insurance Products in India.<br>3. Understand the working and functioning of the Life Insurance Sector.<br>4. Understand how to choose life insurance policies based on their needs. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Life Insurance: Nature and uses of Life Insurance; Life Insurance as a collateral, as a measure of financing business continuation, as a protection to property, as a measure of investment. Principles of Life Insurance: General principles and Specific principles. | 15 |
| II | Types of Life Insurance policies/products in India. Proposal and application form, warranties, medical examination, policy construction and delivery, policy provision, lapse revival, surrender value, paid-up policies, maturity, nomination and assignment. Suicide and payment of insured amount; Loan to Policy-holders. | 15 |
| III | Life Insurance Risk: Factors governing sum assured; Methods of calculating economic risk in life insurance proposal. Measurement of risk and mortality tables. Calculation of premium and Bonuses; Treatment of sub-standard risks. Life Insurance products: Traditional / Unit Linked Policies; Individual and Group Policies; With Profit and Without Profit/Whole Life Products, Interest sensitive product: Term Assurance/Annuities, Endowment Assurance etc. | 15 |
| IV | Insurance Documents; Policy Conditions; Group Insurance; Life Insurance Marketing; Post - Issue Matters-Lapse of the Policy due to Non-Payment of Premium. Revival of the Lapsed Policies. Surrender of the Policy – Payment of surrender value. ; Assignment of the Policies.; Settlement of claims – Procedure to be followed. | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>3. Huebner, S. S. and Kennerth, Black Jr.- Life Insurance ; Prentice Hall Inc. Englewood Chiffs, New Jersey.<br>4. M. N. Mishra, 'Insurance-Principles and practice,' S. Chand and co. Ltd.,2003<br>5. Nalini Prave Tripathy, Prabir Pal, 'Insurance theory and practice' TMH2007. |

| Part A – Introduction | | | |
|---|---|---|---|
| Subject | **Banking Financial Services & Insurance** | | |
| Semester | **IV** | | |
| Name of the Course | **Business Banking & Operations** | | |
| Course Code | **B23-BFI-403** | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-C4** | | |
| Level of the course (As per Annexure-I | **Intermediate-Level** | | |
| Pre-requisite for the course (if any) | **None** | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Understand the fundamentals concepts of Business Banking.<br>2. Understand the role of SME in economic development of India.<br>3. Understand the role of bankers in promotion of SME.<br>4. Understand the banking lending products. | | |
| Credits | Theory | Practical | Total |
| | **4** | **0** | **4** |
| Contact Hours/Week | **4** | **0** | **4** |
| Max. Marks: **100**<br>Internal Assessment Marks: **30**<br>End Term Exam Marks: **70** | | Time: **3 Hours** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br>The Paper-Setter shall set *nine* questions in all and the question paper shall be divided into two parts. **Part 'A'** shall comprise *four* short answer type questions from the whole of the syllabus carrying 3.5 marks each, which shall be compulsory. **Part 'B'** shall comprise *eight* questions (*two* questions from each unit) carrying 14 marks each and the student will be required to attempt *four* questions selecting *one* question from each unit. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Understanding Business Banking- Definition & characteristics, Accounts & deposits- Current Account, Lending products- Funded Services-Working Capital Finance, Short term Finance, Bill Discounting, Structured Finance, Export Credit, Loan syndication, Term Lending. Non-Funded Services-Letter of Credit, Bank Guarantees, Collection of Documents | 15 |
| II | Value Added Services-Real Time Gross Settlement, Forex Risk Management, Cash Management Services, Channel Financing, Corporate Salary Account, Employees Trusts, Return on Cash Surplus, Tax Payment, Other services – treasury, trade & forex | 15 |
| III | SME: Definition & characteristics, Rationale; Objective; Scope; Role of SME in Economic Development of India; RBI & GoI directives, Challenges in SME Business | 15 |
| IV | Role of Bankers-Role of Commercial Banks in promotion of SME, Director of Industries; DIC; SIDO; SIDBI; Small Industries Development Corporation (SIDC); SISI; NSIC; NISBUD; State Financial Corporation SIC | 15 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **5**<br>● Seminar/presentation/assignment/quiz/class test etc.: **10**<br>● Mid-Term Exam: **15** | End Term Examination: **70** |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>1. C.S.V. Murthy, Small-Scale Industries and Entrepreneurship. Himalaya Publishing House, Delhi.<br>2. Bimal Jaiswal, Bankling Operations Management, Vikas Publishing House.<br>3. M.Y. Khan, Financial Services, Tata Mc Graw-Hill. |

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Home science | | |
| Semester | IV | | |
| Name of the Course | Chocolate Crafts | | |
| Course Code | B23-VOC-203 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | VOC-2 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | Senior Secondary(10+2) or equivalent in any stream | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1.To understand the processing of cocoa beans and various types of chocolates.<br>2.To understand the process of chocolate making<br>3.To understand various defects in chocolate and types of moulds<br>4.To understand the various aspects and importance of chocolate packaging<br>5*.● To learn the basic principles, hygiene and precautions of chocolate crafting and entrepreneurship in chocolate industry. | | |
| Credits | Theory | Practical | Total |
| | **2** | **2** | **4** |
| Contact Hours | **2** | **4** | **6** |

| | |
|---|---|
| **Max. Marks:100**<br>**Internal Assessment Marks:15(T) +15(P)=30**<br>**End Term Exam Marks: 35(T) +35(P)=70** | **Time:3hrs(T)**<br>**4hrs(P)** |

**Part B- Contents of the Course**

**Instructions for Paper- Setter:** The examiner will set nine questions in all, selecting two questions from each unit and one compulsory objective type question.

**Instructions for the candidate:** The candidates will attempt five questions in all, selecting at least one question from each unit as well as compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Top Chocolate Brands from across the world<br>Types of Chocolate: Covertures' chocolate, Dark Chocolate, Milk chocolate, White chocolate, Compound chocolate Drinking chocolate, Cocoa powder<br>Processing of Cocoa Beans: (a) Primary processing<br>(b) Secondary Processing | 8 |
| II | Products of cocoa: Cocoa mass or liquor, cocoa butter, cocoa powder, chocolate and chocolate chips<br>Chocolate manufacturing Process<br>Types of chocolate moulds and their care | 7 |
| III | Defects in Chocolates like sugar bloom and fat bloom<br>Points to be kept in mind while Storing Chocolate<br>Precautions and hygiene practices while handling Chocolate | 7 |
| IV | Packaging of Chocolate: (a) Common Chocolate Packaging materials (b) Qualities of packaging material used in Chocolate<br>(c ) Advantages of Chocolate Packaging<br>Health effects of Chocolate on human beings | 8 |

| | | |
|---|---|---|
| V* | ● Introduction to different kinds of Chocolates.<br>● Market survey of Indian and internationally made Chocolates with respect to label reading (ingredients).<br>● Portfolio of different Chocolate brands along with their Labels.<br>● Equipment's (moulds, scrapers, piping bags, nozzles, cooking thermometers, microwave, double boiler) and precautions to be used in handling Chocolate.<br>● Making Molded Compound Chocolate & its Variations<br>● Making center filled Chocolate & Variations of Centre filled Chocolate<br>● Preparation of Healthy Chocolates<br>● Making Chocolate from Cocoa Powder<br>● Visit to Chocolate factory or Chocolate Exhibition | 60 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **04**<br>● Seminar/presentation/assignment/quiz/class test etc.: **04**<br>● Mid-Term Exam: **07**<br>➢ **Practicum**<br>● Class Participation: **05**<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:**10**<br>● Mid-Term Exam: **NA** | | **End Term Examination:**<br>**35**<br>**35** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>● Afoakwa E.O. (2013). Chocolate Science and Technology, Wiley India Pvt Ltd, 978- 8126545735.<br>● Beckette S.T. (2018). The Science of Chocolate, Royal Society of Chemistry, 978- 1788012355.<br>● Minifie B.W. (1999). Chocolate, Cocoa and Confectionary, Aspen Publication. 978- 0834213012.<br>● Manay, S. & Shadaksharaswamy, M. (2020). Foods: Facts and Principles, New Age Publishers. 978-8122422153.<br>● Panda, H. (2012). Technology of Confectionery, Chocolates, Toffee, Candy, Chewing & Bubble Gums, Lollipop and Jelly Products with Formulations, Engineers India Research Institute publisher. 978-9380772165. |

*Applicable for courses having practical components.

| Session: 2023-24 | |
|---|---|
| **Part A - Introduction** | |
| Subject | Bachelor of Home Science |
| Semester | IV |
| Name of the Course | Fashion Jewellery Making |
| Course Code | B23-VOC-220 |
| Course Type:<br><br>(CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | VOC 2 |
| Level of the course (As per Annexure-I) | 100-199 |
| Pre-requisite for the course (if any) | Senior Secondary(10+2) or equivalent in any stream |

| | | | |
|---|---|---|---|
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Identify the traditional jewellery of India.<br>2. Prepare various types of jewellery with different materials.<br>3. Sketch, paint and prepare fashion accessories.<br>4. Get acquainted with hallmarking and care of jewellery.<br>5*5. *Get practical knowledge of fashion jewellery and accessory designing. | | |
| Credits | Theory | Practical | Total |
| | **2** | **2** | **4** |
| Contact Hours | **2** | **4** | **6** |
| **Max. Marks:100**<br>**Internal Assessment Marks:15(T) +15(P)=30**<br>**End Term Exam Marks: 35(T) +35(P)=70** | | **Time:3hrs(T)**<br>**4hrs(P)** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter:** The examiner will set nine questions in all, selecting four questions from each unit and one compulsory objective type question.<br><br>**Instructions for the candidate:** The candidates will attempt five questions in all, selecting atleast one question from each unit as well as compulsory question. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | History of Jewellery, Fundamentals of Jewellery Designing<br><br>Type of Jewellery : Earring, Pendant, Ring, Bracelet, Brooches, Bangles, Anklets etc.<br><br>Sources & Inspirations of Design. | 8 |
| II | Elements of Art and Principles of Design, Colour: Introduction, definition, properties and importance of colours. | 7 |
| III | Main features of traditional Jewellery in India: Rajasthan, Gujarat, North Kashmir, Bengal, Madras, Maharashtra. | 8 |
| IV | Tools and material used in making different types of Jewellery, Safety and Care of Jewellery, Hallmarking of jewellery. | 7 |

| | | |
|---|---|---|
| V* | · Designing Women's Jewellery :– • Brooches • Earring • Pendant • Rings • Bracelets • Party-wear Necklace<br><br>· Designing Men's Jewellery:– • Cufflinks • Rings • Bracelets • Pendants • Tie pin<br><br>· Designing Teen & Youth's jewellery :– • Pendants • Earrings • Rings • Bracelets<br><br>· Various types of painting and sketching of fashion accessories like belts, caps, hats, scarves, foot wears, handbags, hand watches etc. and will prepare any two articles of fashion accessories.<br><br>· Jewellery designing with the help of fabric, beads, clay, metal, paper quilling and resin etc.<br><br>· Rendering and redesigning of fashion jewellery with 3D cones, mirrors, glitters, nail paints etc.<br><br>· Recycling of the scrap into useful fashion accessories.<br><br>· Presentation and exhibition of prepared fashion accessories. | 60 |

| **Suggested Evaluation Methods** | |
|---|---|
| **Internal Assessment:**<br><br>➢ **Theory**<br>● Class Participation:**04**<br>● Seminar/presentation/assignment/quiz/class test etc.:**04**<br>● Mid-Term Exam:**07** | **End Term Examination:**<br><br>**35** |
| ➢ **Practicum**<br>● Class Participation:**05**<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:**10**<br>● Mid-Term Exam: **NA** | **35** |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br>· Jewellery by Dana Buscaglia<br>· Jewellery Illustrations Series Book 5: Finger Rings: 54 Finger Ring Designs (Jewellery Illustration Books) by Irfana Designs<br>· Collection of jewellery designs : Jewellery design by Sonam munot.<br>· The Handicrafts of Rajasthan by Pannalal Meghwal |

*Applicable for courses having practical component.

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Bachelor of Home science | | |
| Semester | IV | | |
| Name of the Course | Ayurveda: Principles of lifestyle | | |
| Course Code | B23-VAC-310 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | VAC-3 | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | Senior Secondary(10+2) or equivalent in any stream | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. To get an insight about ayurvedic science , regional food traditions and rich sources of nutrients<br>2. To know the importance of panchabhuta and tridosha theory and lifestyle management<br>3.To get knowledge about ayurvedic rasas , incompatible foods and effect of aahar on emotions<br>4.Role of ayurveda in relieving stress , food based therapeutics and transition in lifestyle and nutrition over time.<br>_____<br>5*. NA | | |
| Credits | Theory | Practical | Total |
| | **2** | **-** | **2** |
| Contact Hours | **2** | **-** | **2** |

| | |
|---|---|
| **Max. Marks:50**<br>**Internal Assessment Marks:15**<br>**End Term Exam Marks:** 35 | **Time: 3 hrs.** |

**Part B- Contents of the Course**

**Instructions for Paper- Setter:** The examiner will set nine questions in all, selecting two questions from each unit and one compulsory objective type question.
**Instructions for the candidate:** The candidates will attempt five questions in all, selecting at least one question from each unit as well as compulsory question.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Ayurvedic Science: Introduction and its principles<br>Regional Food Traditions of India<br>Understanding rich sources of Nutrients | 8 |
| II | Panchamahabhuta theory: Introduction and its importance , Concept of Tridosha (Vatta, Pitta and Kapha) and its Assessment<br>Lifestyle management with Dinacharya and Ritucharya | 7 |
| III | Introduction to six Rasas<br>Incompatible Foods according to Ayurveda<br>Types of Aahar and their effect on our Emotions | 7 |
| IV | Nutrition and Lifestyle transition over the years<br>Role of Ayurveda in relieving Stress<br>Food based Therapeutics: Combination of traditional and modern food science | 8 |
| V* | | |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>● Class Participation: **04**<br>● Seminar/presentation/assignment/quiz/class test etc.:**04**<br>● Mid-Term Exam: **07**<br>➢ **Practicum**<br>● Class Participation:<br>● Seminar/Demonstration/Viva-voce/Lab records etc.:<br>● Mid-Term Exam: | **End Term Examination:**<br><br>**35**<br><br><br><br>**NA** |
| **Part C-Learning Resources** | |
| **Recommended Books/e-resources/LMS:**<br><br>1. Rastogi S(2014)Ayurvedic science of food and nutrition. ASIN:BOOHWMV094, Springer:ISBN-13:978-1461496274<br>2. Rastogi S (2010) Building bridges between Ayurveda and modern science .Int J Ayurveda Res. 1(1):41-46.<br>3. Frawley D (2012) Ayurvedic healing: A comprehensive guide. Lotus Press, India.<br>4. SunetraRoday (2017). Food Science and Nutrition, Oxford University Press, New Delhi.<br>5. Mudambi, S.R. and Rao S. Fundamentals of Food & Nutrition. (2nd ed.) Wiley Eastern Ltd.: New Delhi.<br>6. Ayurveda for healthy living ( the science of life) ,by Dr. Baldeep kaur<br>**7.** Textbook of Ayurveda : A complete guide to clinical assessment , volume two by Vasant D. Lad<br>8. https://iksindia.org/: Indian knowledge systems | |

*Applicable for courses having practical components.

# KURUKSHETRA UNIVERSITY

# KURUKSHETRA

**(Established by the state legislature Act XII of 1964)**
**$A^+$ Grade NAAC Accredited)**

# REVISED

## Scheme of Examination and Syllabus for

## Under-Graduate Programme

## Subject: Chemistry Minor Paper i.e. CC-M2,

## B-23 CHE-203

# Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020 w.e.f. 2023-24

# DEPARTMENT OF CHEMISTRY, KURUKSHETRA UNIVERSITY, KURUKSHETRA

**FIRST YEAR: SEMESTER-1**

| Remarks | Course | Paper(s) | Nomenclature of Paper | Credits | Hours/ Week | Internal marks | External Marks | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A & C | CC-1 MCC-1 4 credit | B-23 CHE 101 | Chemistry-I | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 hrs. |
| Scheme C only | MCC-2 4 credit | B-23 CHE 102 | Physical Chemistry-I | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 hrs. |
| Scheme A & D | CC-M1 2 credit | B-23 CHE 103 | Minor Chemistry-I | 1 | 1 | 10 | 20 | 30 | 2 hr |
| | | | Practical | 1 | 2 | 05 | 15 | 20 | 2 hrs |
| Scheme A, C & D | MDC-1 3 credits | B-23 CHE 104 | Introductory Chemistry-I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 1 | 2 | 5 | 20 | 25 | 3 hrs. |
| Scheme C only | CC-M1 4 credit | From Available CC-I/MCC-I of 4 credits as per NEP | | | | | | | |

**FIRST YEAR: SEMESTER-2**

| Remarks | Course | Paper(s) | Nomenclature of Paper | Credits | Hours/ Week | Internal marks | External Marks | Total Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A & C | CC-2 MCC-3 4 credit | B-23 CHE 201 | Chemistry-II | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 hrs. |
| Scheme C only | DSEC 1 4 credit | B-23 CHE 202 | Chemistry Skill I | 3 | 3 | 20 | 50 | 70 | 3 hrs. |
| | | | Practical | 1 | 2 | 10 | 20 | 30 | 3 hrs. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Scheme A & D** | **CC-M 2** | | Minor Chemistry-II | 1 | 1 | 10 | 20 | 30 | 2 h |
| | **2 credit** | B-23 CHE 203 | Practical | 1 | 2 | 05 | 15 | 20 | 2 hrs |
| **Scheme A, C & D** | **MDC-2 3 credits** | B-23 CHE 204 | Introductory Chemistry-II | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 1 | 2 | 5 | 20 | 25 | 3 hrs. |
| **Scheme C only** | **CC-M2 4 credit** | From Available CC-2/MCC-3 of 4 credits as per NEP | | | | | | | |
| **Internship of 4 credits of 4-6 weeks duration after 2nd Semester** | | | | | | | | | |

**CC-M2**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Chemistry | | |
| Semester | II | | |
| Name of the Course | **Minor Chemistry-II** | | |
| Course Code | B23-CHE-203 | | |
| Course Type: (CC/MCC/MDC/CC M/DSEC/VOC/DSE/PC/AEC/ VA C) | CC-M | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | 4.0 | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. To know the basics of periodic properties and hybridization.<br>2. To learn about the ionic solids.<br>3. Understand about the semiconductors and metallic bonds.<br>4. Get the knowledge of stereochemistry of simple organic molecules.<br>5*. Hand on practice in preparation of solutions, compounds, estimation and determination of physical properties of some compounds. | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| Contact Hours | 15 | 30 | 45 |
| **Max. Marks:30 + 20*<br>Internal Assessment Marks:10 + 05*<br>End Term Exam Marks: 20 + 15*** | | **Time:02 + 02* hrs** | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br><br>**Note:** The examiner is requested to set nine questions in all, selecting two questions from each SECTION and one question (Question No.1 based on entire syllabus will consist of short answer type. All questions carry equal marks. The candidate is required to attempt five questions in all selecting one from each SECTION. Question No.1 is compulsory. Log table and non programmable calculator is allowed. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | **Periodic table and atomic properties**<br>**Atomic properties**: atomic and ionic radii, ionisation energy, electron affinity and electronegativity definition, trend in periodic table, effective nuclear charge, Slater's rules. | 4 |
| II | **Ionic Solids:**<br>Stoichiometric and Non-stoichiometric defects in crystals, Lattice energy and Born- Haber cycle, Solvation energy and its relationship with solubility of Ionic solids, Polarizing power and Polarisability of ions, Fajan's rule. | 4 |
| III | **Structure and Bonding in Organic Compounds** Localized and delocalized chemical bond, Van der Waal's interactions, resonance: conditions and resonance effect, hyperconjugation, inductive effect, Electromeric effect & their comparison. | 4 |
| IV | **Gaseous State**<br>Kinetic theory of gases, Calculation of root mean square velocity, average velocity, and most probable velocity. Collision diameter, collision number, collision frequency and mean free path (derivations excluded). | 3 |
| V* | 1. Acid/Base titration: Determination of strength of oxalic acid using NaOH.<br>2. Redox titrations: Determination of $Fe^{2+}$ ions using $KMnO_4$. 3. To determine the surface tension of given liquid using stalagmometer by drop no. method.<br>4. To prepare a sample of iodoform. | 30 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment: 10 + 05***<br>➢ **Theory**<br>• Class Participation: 3<br>• Seminar/presentation/assignment/quiz/class test etc.: 3<br>• Mid-Term Exam: 4<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva -voce/Lab records etc.: 05*<br>• Mid-Term Exam: NA | **End Term Examination:**<br><br>**20 + 15*** |
| **Part C-Learning Resources** | |
| **Recommended Books/e-resources/LMS:**<br><br>1. Huheey, J.E.; Keiter, E.A.; Keiter; R. L.; Medhi, O.K. (2009),**Inorganic Chemistry Principles of Structure and Reactivity**, Pearson ducation.<br>3. Atkins, P.W.; Paula, J.de. (2014),**Atkin's Physical Chemistry Ed**., 10th Edition, Oxford UniversityPress.<br>4. Kapoor, K.L.(2015),**A Textbook of Physical Chemistry**,Vol 1, 6 th Edition, McGraw HillEducation.<br>5. Khosla, B.D.; Garg, V.C.; Gulati, A. (2015),**Senior Practical Physical Chemistry**, R. Chand &Co, New Delhi. | |

*Applicable for courses having practical component.

**Annexure to Item 10(34)**

# Kurukshetra University, Kurukshetra

**(Established by the State Legislature Act XII of 1956)**
**('A++' Grade, NAAC Accredited)**

|| योगस्थः कुरु कर्माणि ||
समबुद्धि व योगयुक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Syllabus of Examination (2nd Semester) for Under-Graduate Programmes

**Bachelor of Computer Applications (BCA)**

according to

Curriculum Framework for Under-Graduate Programmes

As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)

## DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

(For the Batches Admitted From 2023-2024)

**DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS**
**KURUKSHETRAUNIVERSITY,KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **Part A-Introduction** | | | |
| Subject | BCA | | |
| Semester | II | | |
| Name of the Course | Object Oriented Programming using C++ | | |
| Course Code | B23-CAP-201 | | |
| Course Type:(CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | B23-CAP-101 | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Learn the input/output statements and functions in C++.<br>2. Get familiar with OOPS concepts along with constructors and destructors in C++ language.<br>3. Learn the various concepts of operator overloading and inheritance.<br>4. Get familiar with concepts of virtual functions and exception handling in C++ language.<br>5*.implement the programs based on various concepts of C++. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-Contents of the Course** | | | |

**Instructions for Paper-Setter**

The examiner will set a total of nine questions. Out of which, the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate will have to attempt five questions, selecting one from each unit.First

| Question will be compulsory.<br>The practicum will be evaluated by an external and an internal examiner.The examination will be of three-hour duration. | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | **Input Output in C++**: Unformatted and Formatted I/O Operations. I/O using insertion and extraction operators and streams in C++.<br>**Functions**: Declaration and Definition, return values, arguments, passing parameters by value, call by reference, call by pointer, Recursion, Inline Functions, Function overloading.<br>Pointers, structures, and union in C++. | 11 |
| II | **Object-oriented features of C++**: Class and Objects, Data hiding & encapsulation, abstraction, Data Members and Member Functions, accessing class members, empty class, local class, global class, Scope Resolution Operator and its Uses, Static Data Members, Static Member Functions, Structure vs Class, Friend function and friend class.<br>**Constructors and Destructors**: Constructors, Instantiation of objects, Default constructor, Parameterized constructor, Copy constructor and its use, Destructors, Dynamic initialization of objects. | 12 |
| III | **Operator Overloading:** Overloading unary and binary operators: arithmetic operators, manipulation of strings using operators.<br>**Inheritance**: Derived class, base class, Accessing the base class member, Inheritance: multilevel, multiple, hierarchical, hybrid; Virtual base class, Abstract class. | 11 |
| IV | Virtual Functions, pure virtual functions; Polymorphism & its types<br>**Exception Handling in C++**: exception handling model, exception handling constructs - try, throw, catch, Order of catch blocks, Catching all exceptions, Nested try blocks, handling uncaught exceptions. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Write a C++ program to print the following lines:<br>  • Your introduction<br>  • Your institute introduction<br>• Write a program that accepts principle, rate, and time from the user and prints the simple interest.<br>• Write a program to swap the values of two variables.<br>• Write a program to check whether the given number is even or odd (using ?: ternary operator).<br>• Write a program to check whether the given number is positive or negative (using?: ternary operator).<br>• Write a program that inputs three numbers and displays the largest number using the ternary operator.<br>• WAP to initialize data members of the class using the constructor.<br>• Pass values to the constructor and initialize the members of that class to those values. | 30 |

| | | |
|---|---|---|
| | • Create a class called cube with the data members Length, Breadth, Height<br>  • Members functions:<br>  • To accept the details.<br>  • To calculate the volume of the cube.<br>  • To display the details.<br>• WAP to calculate the sum using constructor overloading.<br>• WAP to demonstrate the use of destructor.<br>• Create a C++ Program to show the order of constructor and destructor.<br>• C++ Program to Find the Number of Vowels, Consonants, Digits, and White Spaces in a String<br>• C++ Program to Multiply Two Matrices by Passing Matrix to Function<br>• Increment ++ and Decrement -- Operator Overloading in C++ Programming<br>• C++ Program to Add Two Complex Numbers<br>• C++ Program to Show Function Overriding<br>• C++ Program to Show Polymorphism in Class<br>• C++ Program to Show Function Overloading<br>• C++ Program to Show Inheritance | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• Class Participation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-Term Exam: NA | **End-Term Examination:**A three-hour exam for both theory and practicum.<br>**EndTermExam Marks:70(50(T) +20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Herbert Schildt, C++, The Complete Reference, Tata McGraw-Hill
- Robert Lafore, Object Oriented Programming in C++, SAMS Publishing
- Bjarne Stroustrup, The C++ Programming Language, Pearson Education
- Balaguruswami, E., Object Oriented Programming In C++, Tata McGraw-Hill.
- Richard Johnson, An Introduction to Object-Oriented Application Development, Thomson Learning.

*Applicable for courses having practical components.

**DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS**
**KURUKSHETRAUNIVERSITY,KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | BCA | | |
| Semester | II | | |
| Name of the Course | Introduction to Web Technologies | | |
| Course Code | B23-CAP-202 | | |
| Course Type:(CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course(ifany) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Learn the basics of web development.<br>2. understand different types of web pages and websites.<br>3. Implement HTML and CSS for web page designing.<br>4. Understand the design of web crawlers and search engines.<br>5*. implement the programs based on various concepts of web development. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **Part B-Contents of the Course** | | | |
| **Instructions for Paper-Setter**<br>Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.<br>Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.<br>Practicumwillbeevaluatedbyanexternalandaninternalexaminer.Examinationwillbeof | | | |

| three-hourduration. | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Internet and World Wide Web (WWW); Evolution and History of World Wide Web, Web Pages and Contents, Web Clients, Web Servers, Web Browsers; Hypertext Transfer Protocol, URLs; Searching, Search Engines and Search Tools.<br>Web Publishing: Hosting website; Internet Service Provider; Planning and designing website; Web Graphics Design, Steps For Developing website | 11 |
| II | Creating a Website and Introduction to Markup Languages (HTML and DHTML), HTML Document Features & Fundamentals, HTML Elements, Creating Links; Headers; Text styles; Text Structuring; Text color and Background; Formatting text; Page layouts, Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes, HTML5 | 12 |
| III | Introduction to CSS (Cascading Style Sheets): Features, Core Syntax, Types, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Positioning, and other useful Style Properties; Features of CSS3. | 11 |
| IV | The Nature of JavaScript: Evolution of Scripting Languages, JavaScript-Definition, Programming for Non-Programmers, Introduction to Client–Side Programming, Enhancing HTML Documents with JavaScript. Static and Dynamic web pages | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limitedtobut includingthefollowingtypes ofproblems:<br>• Create a web page using an ordered list and an unordered list.<br>• Design a web page to show your institute with hyperlinks.<br>• Create your resume on an HTML page.<br>• Create a web page and divide the web page into four frames. In one frame create three links that will display different HTML forms in the remaining three frames respectively.<br>• Create a web page to show the college record in the form of a table.<br>• Write anHTML code to add internal CSS on a webpage<br>• Design a blog-style personal website. | 30 |

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| | • Design a web page to display your college with hyperlinks.<br>• Write a JavaScript function to calculate the sum of two numbers.<br>• Write a JavaScript program to find the maximum number in an array.<br>• Write a JavaScript function to check if a given string is a palindrome (reads the same forwards and backward).<br>• Write a CSS file and attachit to any 3 HTML webpages.<br>• Use Div and span in a page and color two words with the same colors.<br>• Using HTML,CSS create a styled checkbox with animation on state change<br>• Design a web page that is like a compose page of e-mail. It should have:<br>a) Text boxes for To, CC, and BCC respectively.<br>b) Text field for the message.<br>c) Send button.<br>d) Option for selecting a file for attachment<br>• After clicking the send button a new page should open with the display message "Message has been sent". | |

**SuggestedEvaluationMethods**

| | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExamMarks:70(50(T)+20(P))** |

**PartC-LearningResources**

**RecommendedBooks/e-resources/LMS:**

- Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.
- Ramesh Bangia, Multimedia and Web Technology, Firewall Media.
- Thomas A. Powell, Web Design: The Complete Reference, Tata McGraw-Hill
- Wendy Willard, HTML Beginners Guide, Tata McGraw-Hill.
- Deitel and Goldberg, Internet and World Wide Web, How to Program, PHI
- David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.
- Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd.

*Applicablefor courseshavingpracticalcomponents.

**DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS**
**KURUKSHETRAUNIVERSITY,KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | BCA | | |
| Semester | II | | |
| Nameofthe Course | Concepts of Operating Systems | | |
| CourseCode | B23-CAP-203 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | CC | | |
| Level of the course (As perAnnexure-I | 100-199 | | |
| Pre-requisiteforthecourse(ifany) | | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,the learnerwill beable to:<br>1. understand the basic concepts of operating systems and their services along with process management.<br>2. understand the concept of process scheduling and acquire knowledge of process synchronization.<br>3. learn about memory management and virtual memory concepts.<br>4. learn to work with directory structure and security aspects.<br>5*.implement the programs based on the operating system. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| ContactHours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-ContentsoftheCourse** | | | |
| **<u>InstructionsforPaper-Setter</u>**<br>Examiner will set a total of nine questions. Out of which first question will be compulsory.Remaining eight questions will be set from four unit selecting two questions from each unit.Examinationwillbeofthree-hourduration.Allquestionswillcarryequalmarks.Firstquestion | | | |

| | | |
|---|---|---|
| willcompriseshortanswer-typequestionscoveringthe entiresyllabus.<br>The candidatewillhavetoattemptfivequestionsinall,selectingonequestionfromeachunit.Firstquestionwillbecompulsory.<br>The practicumwillbeevaluatedbyanexternalandaninternalexaminer.The examinationwillbeofthree-hourduration. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introductory Concepts: Operating System, Functions and Characteristics, Historical Evolution of Operating Systems, Operating System Structure.<br>Types of Operating System: Real-time, Multiprogramming, Multiprocessing, Batch processing.<br>Operating System Services, Operating System Interface, Service System Calls, and System Programs.<br>Process Management: Process Concepts, Operations on Processes, Process States, and Process Control Block. Inter-Process Communication. | 11 |
| II | CPU Scheduling: Scheduling Criteria, Levels of Scheduling, Scheduling Algorithms, Multiple Processor Scheduling, Algorithm Evaluation.<br>Synchronization: Critical Section Problem, Semaphores, Classical Problem of Synchronization, Monitors.<br>Deadlocks: Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery. | 12 |
| III | Memory Management Strategies: Memory Management of Single-user and Multiuser Operating Systems, Partitioning, Swapping, Contiguous Memory Allocation, Paging and Segmentation;<br>Virtual Memory Management: Demand Paging, Page Replacement Algorithms, Thrashing. | 11 |
| IV | Implementing File System: File System Structure, File System Implantation, File Operations, Type of Files, Directory Implementation, Allocation Methods, and Free Space Management.<br>Disk Scheduling algorithm - SSTF, Scan, C- Scan, Look, C-Look.<br>SSD Management. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited tobut includingthefollowingtypes ofproblems:<br>• Working with various operating systems, and performing different operations using operating systems.<br>• Write a program to print file details including owner access permissions, and file access time, where file name is given as argument.<br>• Write a program to copy files using system calls. | 30 |

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|---|---|---|
| | • Write a program to implement the FCFS scheduling algorithm.<br>• Write a program to implement the Round Robin scheduling algorithm.<br>• Write a program to implement the SJF scheduling algorithm.<br>• Write a program to implement a non-preemptive priority-based scheduling algorithm<br>• Write a program to implement preemptive priority-based<br>• scheduling algorithm.<br>• Write a program to implement the SRJF scheduling algorithm.<br>• Write a program to calculate the sum of n numbers using the thread library.<br>• Write a program to implement first-fit, best-fit, and worst-fit allocation strategies. | |

**SuggestedEvaluationMethods**

| | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExamMarks:70(50(T)+20(P))** |

**PartC-LearningResources**

**RecommendedBooks/e-resources/LMS:**

- Silberschatz A., Galvin P.B.,and Gagne G., Operating System Concepts, John Wiley & Sons.
- Godbole, A.S., Operating Systems, Tata McGraw-Hill Publishing Company, New Delhi.
- Deitel, H.M., Operating Systems, Addison- Wesley Publishing Company, New York.
- Tanenbaum, A.S., Operating System- Design and Implementation, Prentice Hall of India, New Delhi.

*Applicableforcourseshavingpractical components.

**DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS**
**KURUKSHETRAUNIVERSITY,KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | BCA | | |
| Semester | II | | |
| Nameofthe Course | MathematicalFoundationsforComputerScience-II | | |
| CourseCode | B23-CAP-204 | | |
| Course Type:(CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M | | |
| Level of the course (As perAnnexure-I | 100-199 | | |
| Pre-requisiteforthecourse(ifany) | | | |
| CourseLearningOutcomes(CLO): | Afterlearningthiscourse studentwill beable to:<br>1. Understand the concept of integration.<br>2. Acquire cognitive and technical knowledge about a variety of methods of representation of statistical data<br>3. Understand methods of measure of central tendency. Analyze the problem and apply the best measure of central tendency to draw inferences from the available data.<br>4. Understand the concept of correlation, and correlation methods and conclude about the type of correlation for the available data. Comprehend the skills of curve fitting.<br>5. * Attain a range of cognitive and technical skills to integrate various functions. Have the technical and practical skills required for selecting and using suitable methods for data representation and measurement of central tendency. | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| ContactHours | 1 | 2 | 3 |
| **Max.Marks:50(30(T)+20(P))**<br>**InternalAssessmentMarks:15(10(T)+5(P))**<br>**EndTermExamMarks:35(20(T)+15(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-ContentsoftheCourse** | | | |

**InstructionsforPaper-Setter**

The examiner will set a total of nine questions. Out of which the first question will be compulsory.The remaining eight questions will be set from four units selecting two questions from each unit.The examinationwillbeofthree-hourduration.Allquestionswillcarryequalmarks.The firstquestion willcompriseshortanswer-typequestionscovering the entiresyllabus. The candidatewillhavetoattemptfivequestionsinall,selectingonequestionfromeachunit.First questionwillbecompulsory.

The practicumwillbeevaluatedbyanexternalandaninternalexaminer.The examinationwillbeofthree-hourduration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Integration of simple algebraic, trigonometric, and exponential functions.<br>**Presentation of data**: Frequency distribution and cumulative frequency distribution, Diagrammatic and graphical presentation of data, Construction of bar, Pie diagrams, Histograms, Frequency polygon, Frequency curve, and Ogives. | 4 |
| II | **Measures of central tendency**: Arithmetic mean, Median, Mode, Geometric mean, and Harmonic mean for ungrouped and grouped data.<br>**Measures of dispersion**: Concept of dispersion, Mean deviation and its coefficient, Range, Variance and its coefficient, Standard deviation. | 4 |
| III | **Correlation**: Concept and types of correlation, Methods of finding correlation: Scatter diagram, Karl Pearson's coefficients of correlation, Rank correlation. | 3 |
| IV | **Linear regression**: Principle of least square, Fitting of a straight line, Two lines of regression, Regression coefficients. | 4 |
| V* | **Practicum**: Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:<br>**Problem Solving-** Questions related to the practical problems based on the following topics will be worked out and a record of those will be maintained in the Practical Note Book:<br>• Demonstrate skills in finding integration of simple functions.<br>• Representation of data using Bar and pie diagrams.<br>• Representation of data using Histogram, Frequency polygon, Frequency curves, and Ogives.<br>• Problems to compute measures of central tendency.<br>• Problems to calculate measures of dispersion.<br>• Problem to calculate Karl Pearson's coefficient of correlation.<br>• Problem to fit the straight line for the given data.<br>• Problem to find lines of regression. | 30 |

**SuggestedEvaluationMethods**

| | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:4<br>• Seminar/presentation/assignment/quiz/classtestetc.:NA<br>• Mid-TermExam:6<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:5<br>• Mid-TermExam: NA | **End TermExamination: Athree-hourexam for both theory andpracticum.**<br>**EndTermExamMarks:35(20(T)+15(P))** |
| **PartC-LearningResources** | |
| **Text/ReferenceBooks:**<br>• S.C. Gupta and V.K. Kapoor (2014). Fundamentals of Mathematical Statistics, S. Chand & Sons, Delhi.<br>• R.V. Hogg, J. W. McKean and A. T. Craig (2013). Introduction to Mathematical Statistics (7 th edition), Pearson Education.<br>• J. V. Dyke, J. Rogers and H. Adams (2011). Fundamentals of Mathematics, Cengage Learning.<br>• A.S. Tussy, R. D. Gustafson and D. Koenig (2010). Basic Mathematics for College Students. Brooks Cole.<br>• G. Klambauer (1986). Aspects of calculus. Springer-Verlag. | |

*Applicablefor courseshavingpracticalcomponents.

# Kurukshetra University, Kurukshetra
**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योगयुक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Syllabus of Examination (4th Semester) for Under-Graduate Programmes
**Bachelor of Computer Applications (BCA)**
according to
Curriculum Framework for Under-Graduate Programmes
As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)

## DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

(For the Batches Admitted From 2023-2024)

**DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS**
**KURUKSHETRAUNIVERSITY,KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | BCA | | |
| Semester | IV | | |
| Nameofthe Course | Data Structures and Applications | | |
| CourseCode | B23-CAP-401 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | CC | | |
| Level of the course (As perAnnexure-I | 200-299 | | |
| Pre-requisiteforthecourse(ifany) | Knowledgeof anyComputerProgrammingLanguage | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,the learnerwill beable to:<br>1. learn the basics of data structure and algorithm complexities.<br>2. acquire knowledge of arrays and strings.<br>3. understand the idea of implementation for linked lists and stacks.<br>4. learn various searching and sorting techniques along with the implementation of queues.<br>5*developtheprojectwith data structures. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| ContactHours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-ContentsoftheCourse** | | | |

**<u>InstructionsforPaper-Setter</u>**

The examiner will set a total of nine questions. Out of which first question will be compulsory.Remaining eight questions will be set from four unit selecting two questions from each unit.Examination will be of three-hour duration. All questions will carry equal marks. First questionwill compriseofshort answertypequestions coveringentiresyllabus.

Candidate will have to attempt five questions in all, selecting one question from each unit. Firstquestionwillbecompulsory.

Practicum will be evaluated by an external and an internal examiner. Examination will be ofthree-hourduration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Data Structure** Definition, Data Type vs. Data Structure, Classification of Data Structures, Data Structure Operations, Applications of Data Structures.<br>**Algorithm Specifications**: Performance Analysis and Measurement (Time and Space Analysis of Algorithms- Average, Best and Worst Case Analysis).<br>**Arrays**: Introduction, Linear Arrays, Representation of Linear Array in Memory, Two Dimensional and Multidimensional Arrays, Sparse Matrix and its Representation, Operations on Array: Algorithm for Traversal, Selection, Insertion, Deletion and its implementation. | 11 |
| II | **String Handling**: Storage of Strings, Operations on Strings viz., Length, Concatenation, Substring, Insertion, Deletion, Replacement, Pattern Matching<br>**Linked List**: Introduction, Array vs. linked list, Representation of linked lists in Memory, Traversing a Linked List, Insertion, Deletion, Searching into a Linked list, Type of Linked List. | 11 |
| III | **Stack**: Array Representation of Stack, Linked List Representation of Stack, Algorithms for Push and Pop, Application of Stack: Polish Notation, Postfix Evaluation Algorithms, Infix to Postfix Conversion, Infix to Prefix Conversion, Recursion.<br>**Introduction to Queues**: Simple Queue, Double Ended Queue, Circular Queue, Priority Queue, Representation of Queues as Linked List and Array, Applications of Queue. Algorithm on Insertion and Deletion in Simple Queue and Circular Queue. Priority Queues. | 12 |
| IV | **Tree:** Definitions and Concepts, Representation of Binary Tree, Binary Tree Traversal (Inorder, postorder, preorder), Binary Search Trees – Definition, Operations viz., searching, insertions and deletion;<br>Searching and Sorting Techniques, Sorting Techniques: Bubble sort, Merge sort, Selection sort, Quick sort, Insertion Sort. Searching Techniques: Sequential Searching, Binary Searching. | 11 |
| V* | **Practicum**:<br>Students are advised to do laboratory/practical practice not limitedtobut includingthefollowingtypes ofproblems:<br>• Write a program that uses functions to perform the following operations on an array i) Creation ii) Insertion iii) Deletion iv) Traversal.<br>• Write a program that uses functions to perform the following operations on strings i) Creation ii) Insertion iii) Deletion iv) Traversal.<br>• Write a program that uses functions to perform the following operations on a singly linked list i) Creation ii) Insertion iii) Deletion iv) Traversal.<br>• Write a program that uses functions to perform the following operations on a doubly linked list i) Creation ii) Insertion iii) Deletion iv) Traversal<br>• Write a program that implement stack (its operations) using i) | 30 |

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|---|---|---|
| | Arrays ii) Linked list(Pointers).<br>• Write a program that implements Queue (its operations) using i) Arrays and ii) Linked lists (Pointers).<br>• Write a program that implements the following sortingi) Bubble sort ii) Selection sort iii)Quick sort.<br>• Write programs for various types of tree traversals. | |

**SuggestedEvaluationMethods**

| | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExam Marks:70(50(T)+20(P))** |

**PartC-LearningResources**

**RecommendedBooks/e-resources/LMS:**

- Seymour Lipschutz, Data Structures, Tata McGraw- Hill Publishing Company Limited, Schaum's Outlines.
- YedidyanLangsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, Data Structures Using C, Pearson Education.
- Trembley, J.P. And Sorenson P.G., An Introduction to Data Structures with Applications, McGraw-Hill.
- Mark Allen Weiss, Data Structures and Algorithm Analysis in C, Addison- Wesley.

* Applicablefor courseshavingpracticalcomponents.

**DEPARTMENTOFCOMPUTERSCIENCE&APPLICATIONS**
**KURUKSHETRAUNIVERSITY,KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | BCA | | |
| Semester | IV | | |
| Nameofthe Course | Front-end Development | | |
| CourseCode | B23-CAP-402 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | CC | | |
| Level of the course (As perAnnexure-I | 200-299 | | |
| Pre-requisiteforthecourse(ifany) | B23-CAP-202 | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,thelearner willbeableto:<br>1. understand the basic concept of objects and regular expressions in JavaScript;<br>2. acquire knowledge of JavaScript events and DOM<br>3. learn to use forms and BOM in JavaScript;<br>**4.** get familiar with jQuery<br>5*.Understandtheprogramming of web pages and handling events using JavaScript and jQuery. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| ContactHours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-ContentsoftheCourse** | | | |

**<u>InstructionsforPaper-Setter</u>**

The examiner will set a total of nine questions. Out of which the first question will be compulsory.The remaining eight questions will be set from four units selecting two questions from each unit.The examination will be of three-hour duration. All questions will carry equal marks. The first questionwill compriseshort answer-typequestions coveringthe entiresyllabus.
The candidate will have to attempt five questions in all, selecting one question from each unit. The firstquestionwillbecompulsory.

| The practicumwillbeevaluatedbyanexternalandaninternalexaminer.Examinationwillbeofthree-hourduration. | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | **Objects in JavaScript**: Introduction to objects, Type of objects in JavaScript, creating objects, Object methods, Constructor function, Prototype in JavaScript, Inheritance using prototype chain.<br>**Regular Expressions**: Introduction to RegExp, Regular expression usage, Modifiers, RegExp patterns, RegExp methods, String methods for RegExp, Type conversion in JavaScript. | 11 |
| II | **Event handling**: JavaScript events, Event handler, Event flow, Event bubbling and capturing, Event listeners, Event types.<br>**Document Object Model (DOM)**: Introduction to DOM, Types of DOM, DOM standards and methods, Manipulating documents using DOM, Handling images, Table manipulation, Animation, Node and Node-list handling | 11 |
| III | **Browser Object Model (BOM)**: Introduction to BOM, DOM vs BOM differences, Window object and methods, BOM navigator, BOM history, BOM location, BOM timer, Introduction to Cookies, Session and persistent cookies.<br>**Form Handling**: Introduction to forms, Form processing, Forms object, Accessing data from forms, Form validation, Additional features in forms, Validation APIs | 12 |
| IV | **Introduction to jQuery**: jQuery Syntax, jQuery Selectors, jQuery Events, jQuery Effects, jQuery HTML, jQuery Traversing, jQuery AJAX, jQuery Misc. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited tobut includingthefollowingtypes ofproblems:<br>• Use of JavaScript in Web page designing<br>• Effective web page design<br>• Creation of Event listeners in JavaScript<br>• Update and modify website elements dynamically using asynchronously retrieved data<br>• Style HTML content with JavaScript<br>• Iterate over arrays and objects using JavaScript for syntax.<br>• JavaScript Program to Create Objects (4 Different Ways)<br>• JavaScript Program to Iterate Over an Object<br>• JavaScript Program to Find Max/Min Value of an Attribute in an Array of Objects<br>• JavaScript Program to Remove Duplicates from an Array of Objects<br>• Writing programs for event handling in JavaScript.<br>• Write a JavaScript function to add rows to a table.<br>• Write a JavaScript program to remove items from a drop-down list.<br>• Write a JavaScript program to calculate sphere volume. | 30 |

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|---|---|---|
| | • Write a JavaScript program to get the window width and height<br>• Using BOM navigation and location<br>• Creating cookies and sessions.<br>• How can you create forms and perform validations on the forms?<br>• How can you use jQuery and perform various functions using jQuery? | |

| **SuggestedEvaluationMethods** | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExamMarks:70(50(T)+20(P))** |

| **PartC-LearningResources** |
|---|
| **RecommendedBooks/e-resources/LMS:**<br>• David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.<br>• Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd.<br>• JavaScript and jQuery: Interactive Front-End Web Development by Jon Duckett<br>• Head First JavaScript Programming: A Brain-Friendly Guide by Elisabeth Robson and Eric Freeman |

*Applicablefor courseshavingpracticalcomponents.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONSKURUKSHETRAUNIVERSITY, KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | BCA | | |
| Semester | IV | | |
| Nameofthe Course | Computer Graphics | | |
| CourseCode | B23-CAP-403 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | CC | | |
| Level of the course (As perAnnexure-I | 200-299 | | |
| Pre-requisiteforthecourse(ifany) | BasicKnowledge ofcomputer | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,the learnerwill beable to:<br>1. understandtheconceptsofcomputer graphics<br>2. learn and implement point, line, and circle drawing algorithms.<br>3. acquire knowledge of two-dimensional transformations and line clipping algorithms.<br>**4.** understand 3-D graphics concepts and acquire skills for designing 3-D graphics<br>5*. to design programs based on theoretical concepts ofComputer Graphics. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| ContactHours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |

**InstructionsforPaper-Setter**

Examiner will set a total of nine questions. Out of which first question will be compulsory.Remaining eight questions will be set from four unit selecting two questions from each unit.Examination will be of three-hour duration. All questions will carry equal marks. First questionwill compriseofshort answertypequestions coveringentiresyllabus.

The candidate must attempt five questions in all, selecting one question from each unit. Firstquestionwillbecompulsory.

Practicum will be evaluated by an external and an internal examiner. Examination will be ofthree-hourduration.

| Part B-Contents of the Course | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | **Introduction**: History of Computer Graphics (CG), Applications of Computer Graphics, Components of interactive graphics systems<br>**Display devices**: Refresh CRT, Color CRT, Plasma Panel displays LCD Panels, Raster-scan System, Random scan System, Graphic software, Input/Output Devices, Tablets | 11 |
| II | **Output Primitives**: Points and Lines, Line Drawing Algorithms: DDA algorithm, Bresenham's algorithm,<br>**Circle drawing Algorithms**: Polynomial Method, Bresenham's algorithm. Parametric representation of Cubic Curves, Bezier Curves | 11 |
| III | **2D Transformation**: Use of Homogeneous Coordinates Systems, Composite Transformation: Translation, Scaling, Rotation, Mirror Reflection, Rotation about an Arbitrary Point. Clipping and Windowing, Clipping Operations.<br>**Line Clipping Algorithms**: The Mid-Point subdivision method, Cohen-Sutherland Line Clipping Algorithms, Polygon Clipping, Sutherland Hodgeman Algorithms, Text Clipping. | 12 |
| IV | **3-D Graphics**: 3-D object representations, 3-D Transformations: Translation, Rotation, Scaling, Projections, **Hidden surface elimination**: Back face removal, Depth Buffer algorithm, Scan-line algorithm, Depth sort algorithm, Shading. | 11 |
| V* | The following activities be carried out/ discussed in the labduring the semester.<br>Programming Lab:<br>• Implement DDA line drawing algorithm for all types of slope.<br>• Implement Bresenham's line drawing algorithm for all types of slopes.<br>• Implement Bresenham's Circle drawing algorithm.<br>• Implement Bresenham's Ellipse drawing algorithm.<br>• Implement various 2-D transformations on objects like lines, rectangles, etc.<br>• Implement to clip a line using the Mid-Point subdivision algorithm<br>• Implement to clip a line using Cohen-Sutherland algorithm<br>• Implement 3-D transformations on objects. | 30 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10 | | **End Term Examination:**<br>**A three-hour exam for both theory and practicum.**<br>**EndTermExamMa** |

| | |
|---|---|
| ➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | **rks:70(50(T)+20(P))** |
| **PartC-Learning Resources** | |
| **RecommendedBooks/e-resources/LMS:**<br>• Donald Hearn, M. Pauline Baker, Computer Graphics, Pearson Education.<br>• J. D. Foley, A. Van Dam, S. K. Feiner and J. F. Hughes, Computer Graphics - Principles and Practice, Pearson Education.<br>• Newmann&Sproull, Principles of Interactive Computer Graphics, McGraw Hill.<br>• Rogers, David F., Procedural Elements of Computer Graphics, McGraw Hill.<br>• Zhigang Xiang, Roy Plastock, Computer Graphics, Tata McGraw Hill. | |

*Applicable for courses having practical components.

# Kurukshetra University, Kurukshetra
**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योगयुक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Syllabus of Examination (2nd Semester) for Under-Graduate Programmes
**Subject: Computer Science**
according to
Curriculum Framework for Under-Graduate Programmes
As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
(For the Batches Admitted From 2023-2024)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONSKURUKSHETRAUNIVERSITY, KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | COMPUTERSCIENCE | | |
| Semester | II | | |
| Nameofthe Course | Web Development | | |
| CourseCode | B23-CSE-201 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | CC | | |
| Level of the course (As perAnnexure-I) | 100-199 | | |
| Pre-requisiteforthecourse(ifany) | | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,thelearner willbeableto:<br>1. learnthebasicsofweb development.<br>2. understand different types of web pages and websites.<br>3. implementHTML and CSS for web page designing.<br>**4.** Understand the design of web crawlers and search engines.<br>5*. to implement the programs based on variousweb development concepts. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| ContactHours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-ContentsoftheCourse** | | | |

**<u>InstructionsforPaper-Setter</u>**

The examiner will set a total of nine questions. Out of which, the first question will be compulsory.The remaining eight questions will be set from four units selecting two questions from each unit.The examination will be of three-hour duration. All questions will carry equal marks. The first questionwill compriseshort answer-typequestionscovering the entiresyllabus.
The candidate will have to attempt five questions, selecting one from each unit. The firstquestionwill becompulsory.

| The practicumwillbeevaluatedbyanexternalandaninternalexaminer.The examinationwillbeof three-hourduration. | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Internet and World Wide Web (WWW); Evolution and History of World Wide Web, Web Pages and Contents, Web Clients, Web Servers, Web Browsers; Hypertext Transfer Protocol, URLs; Searching, Search Engines and Search Tools.<br>Web Publishing: Hosting website; Internet Service Provider; Planning and designing website; Web Graphics Design, Steps For Developing website | 11 |
| II | Creating a Website and Introduction to Markup Languages (HTML and DHTML), HTML Document Features & Fundamentals, HTML Elements, Creating Links; Headers; Text styles; Text Structuring; Text colour and Background; Formatting text; Page layouts, Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes, HTML5. | 11 |
| III | Introduction to CSS (Cascading Style Sheets): Features, Core Syntax, Types, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Positioning, and other useful Style Properties; Features of CSS3. | 12 |
| IV | The Nature of JavaScript: Evolution of Scripting Languages, JavaScript-Definition, Programming for Non-Programmers, Introduction to Client–Side Programming, Enhancing HTML Documents with JavaScript. Static and Dynamic web pages | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited tobut includingthefollowingtypes ofproblems:<br>• Create a web page using an ordered list and an unordered list.<br>• Design a web page to show your institute with hyperlinks.<br>• Create your resume on an HTML page.<br>• Create a web page and divide the web page into four frames. In one frame create three links that will display different HTML forms in the remaining three frames respectively.<br>• Create a web page to show the college records in the form of a table.<br>• Write an HTML code to add internal CSS on a webpage<br>• Design a blog-style personal website. | 30 |

| | | |
|---|---|---|
| | • Design a web page to display your college with hyperlinks.<br>• Write a JavaScript function to calculate the sum of two numbers.<br>• Write a JavaScript program to find the maximum number in an array.<br>• Write a JavaScript function to check if a given string is a palindrome (reads the same forwards and backward).<br>• Write a CSS file and attach it to any 3 HTML web pages.<br>• Use Div and span in a page and color two words with the same colors.<br>• Using HTML, CSS create a styled checkbox with animation on state change<br>• Design a web page that is like a compose page of e-mail. It should have:<br>a) Text boxes for To, CC, and BCC respectively.<br>b) Text field for the message.<br>c) Send button.<br>d) Option for selecting a file for attachment<br>e) After clicking a send button a new page should open with the display message "Message has been sent". | |

**SuggestedEvaluationMethods**

| | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExamMarks:70(50(T)+20(P))** |

**PartC-LearningResources**

**RecommendedBooks/e-resources/LMS:**

- Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.
- Ramesh Bangia, Multimedia and Web Technology, Firewall Media.
- Thomas A. Powell, Web Design: The Complete Reference, Tata McGraw-Hill
- Wendy Willard, HTML Beginners Guide, Tata McGraw-Hill.
- Deitel and Goldberg, Internet and World Wide Web, How to Program, PHI
- David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.
- Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd.

*Applicablefor courseshavingpracticalcomponents.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONSKURUKSHETRAUNIVERSITY, KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | COMPUTERSCIENCE | | |
| Semester | II | | |
| Nameofthe Course | Programming with C++ | | |
| CourseCode | B23-CSE-202 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | DSEC | | |
| Level of the course (As perAnnexure-I | 100-199 | | |
| Pre-requisiteforthecourse(ifany) | | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,thelearner willbeableto:<br>1. understand the basic concept of C++;<br>2. acquire the knowledge of C++ operators, hierarchy and precedence, and various control structures<br>3. learn to use arrays and strings in C++ programs;<br>**4.** get familiar with OOPS concepts with C++<br>5*.understandtheprogramming with C++ for Object-Oriented methodologies. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| ContactHours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-ContentsoftheCourse** | | | |

**<u>InstructionsforPaper-Setter</u>**

The examiner will set a total of nine questions. Out of which the first question will be compulsory.The remaining eight questions will be set from four units selecting two questions from each unit.The examination will be of three-hour duration. All questions will carry equal marks. The first questionwill compriseshort answer-typequestionscoveringthe entiresyllabus.

The candidate will have to attempt five questions, selecting one from each unit. The firstquestionwillbecompulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be ofthree-hourduration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Elements to C++**: Character Set, Keywords, Identifiers, Constants, Variables, Date Types: User-Defined, Built-in, Derived Data Types, Reference Variables Constants, Symbolic constants, Type Conversion, and Type Casting.<br>**Input Output in C++**: Unformatted and Formatted I/O Operations. I/O using insertion and extraction operators and streams in C++.<br>**Operators in C++**: Arithmetic, Relational, Logical, Ternary, and other type of operators, Precedence & associativity of Operators. | 11 |
| II | **Decision and Control Structures**: if statement, if-else statement, nested if, if-else-if ladder, switch case statement, break and continue, goto statement, nested switch case statement. **Loops**: while loop, do-while loop, for loop.<br>**Arrays and strings**: Array definition, initialization, multidimensional arrays, Manipulation of array elements.<br>**Functions**: Declaration and Definition, return values, arguments, passing parameters by value, call by reference, call by pointer, Recursion, Inline Functions, Function overloading. | 11 |
| III | Pointers, structures, and union in C++.<br>**Object-oriented features of C++**: Class and Objects, Data hiding & encapsulation, abstraction, Data Members and Member Functions, accessing class members, empty class, local class, global class, Scope Resolution Operator and its Uses, Static Data Members, Static Member Functions, Structure vs Class, Friend function and friend class.<br>**Constructors and Destructors**: Constructors, Instantiation of objects, Default constructor, Parameterized constructor, Copy constructor and its use, Destructors, , Dynamic initialization of objects. | 11 |
| IV | **Operator Overloading:** Overloading unary and binary operators: arithmetic operators, manipulation of strings using operators.<br>**Inheritance**: Derived class, base class, Accessing the base class member, Inheritance: multilevel, multiple, hierarchical, hybrid; Virtual base class, Abstract class.<br>Virtual Functions, pure virtual functions; Polymorphism & its types | 12 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited tobut includingthefollowingtypes ofproblems:<br>• Write a C++ program to print the following lines:<br>  o Your introduction<br>  o Your institute introduction<br>• Write a program thataccepts principle, rate, and time from the user and prints the simple interest.<br>• Write a program to swap the values of two variables.<br>• Write a C++ program to prompt the user to input 3 integer values and print these in forward and reversed order.<br>• WAP to accept and display distance in feet and inches.<br>• Write a program to swap the values of two variables without using a third variable.<br>• Write a program to check whether the given number is even or odd (using ?: ternary operator).<br>• Write a program to check whether the given number is positive or negative (using?:ternary operator). | 30 |

| | | |
|---|---|---|
| | • Write a program thatinputs three numbers and displays the largest number using the ternary operator.<br>• WAP to initialize data members of the class using the constructor.<br>• Pass values to the constructor and initialize the members of that class to those values.<br>• Create a class called cube with the data members Length, Breadth, Height<br>  ○ Members functions:<br>  ▪ To accept the details.<br>  ▪ To calculate the volume of the cube.<br>  ▪ To display the details.<br>• WAP to calculate the sum using constructor overloading.<br>• WAP to demonstrate the use of destructor.<br>• Create a C++ Program to show the order of constructor and destructor.<br>• C++ Program to Find the Number of Vowels, Consonants, Digits, and White Spaces in a String<br>• C++ Program to Multiply Two Matrices by Passing Matrix to Function<br>• Increment ++ and Decrement -- Operator Overloading in C++ Programming<br>• C++ Program to Add Two Complex Numbers<br>• C++ Program to Show Function Overriding<br>• C++ Program to Show Polymorphism in Class<br>• C++ Program to Show Function Overloading<br>• C++ Program to Show Inheritance | |

**SuggestedEvaluationMethods**

| | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExamMarks:70(50(T)+20(P))** |

**PartC-LearningResources**

**RecommendedBooks/e-resources/LMS:**

- Herbert Scildt, C++, The Complete Reference,Tata McGraw-Hill
- Robert Lafore, Object Oriented Programming in C++, SAMS Publishing
- Bjarne Stroustrup, The C++ Programming Language, Pearson Education
- Balaguruswami, E., Object Oriented Programming In C++, Tata McGraw-Hill.
- Richard Johnson, An Introduction to Object-Oriented Application Development, Thomson Learning.

*Applicablefor courseshavingpracticalcomponents.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONSKURUKSHETRAUNIVERSITY, KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | COMPUTERSCIENCE | | |
| Semester | II | | |
| Nameofthe Course | Programming Methodologies | | |
| CourseCode | B23-CSE-203 | | |
| Course Type:(CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M | | |
| Level of the course (As perAnnexure-I | 100-199 | | |
| Pre-requisiteforthecourse(ifany) | | | |
| CourseLearningOutcomes(CLO): | Afterlearningthiscourse studentswill beable to:<br>1. Understand theproblem-solving using algorithmsand flowcharts.<br>2. understandtheconcept of program and debugging.<br>3. learnthebasicprogramming constructs.<br>4. understand various programming methodologies.<br>5. understand the various programming methodologies by implementing these practically. | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| ContactHours | 1 | 2 | 3 |
| **Max.Marks:50(30(T)+20(P))**<br>**InternalAssessmentMarks:15(10(T)+5(P))**<br>**EndTermExamMarks:35(20(T)+15(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-Contents oftheCourse** | | | |
| **<u>InstructionsforPaper-Setter</u>** | | | |

| **Unit** | **Topics** | **Contact Hours** |
|---|---|---|
| I | **Problem Solving**: Understanding the problem, Analyzing the problem, and Identifying the solution.<br>**Tools for Problem-Solving**: Flowcharts and its Symbols. Algorithm designing. Examples of Algorithms with flow chart. Decision Table. | 4 |

| | | |
|---|---|---|
| II | **Program**: Concept of a program, Need for writing programs, Characteristics of a good program, Programming style, Documentation, and Program Maintenance.<br>**Debugging Programs**: Syntax Errors, Run-Time Errors, Logical Errors.<br>Process of conceptualizing a solution to a problem and moving from algorithm to programming. | 4 |
| III | **General Concepts**: Clarity and Simplicity of Expressions, Use of proper names for Identifiers, Comments, Indentation; and Documentation.<br>**Programming Constructs**: Sequence, Selection, and Iteration; Simulation (dry run) of the program for better understanding of algorithm; Comparison and Analysis of Algorithms through simulations. | 4 |
| IV | **Methodologies**: Structured programming, Top-down approach, Bottom-up approach, Functional programming, Modular programming, and Object-oriented programming. | 3 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice notlimitedto butincludingthefollowingtypes ofproblems:<br>• Draw a flowchart and design an algorithm that calculates simple interest using principle, rate, and time.<br>• Draw a flowchart and write an algorithm to swap the values of two variables.<br>• Draw a flowchart and design an algorithm to check whether the given number is even or odd.<br>• Draw a flowchart and design an algorithm that inputs three numbers and displays the largest number.<br>• Draw a flowchart and design an algorithm to find the smallest from n numbers.<br>• Draw a flowchart and design an algorithm to find the greatest from n numbers.<br>• Draw a flowchart and design an algorithm to find the sum and average of n input numbers.<br>• Draw a flowchart and design an algorithm to find the sum of the digits of the input number.<br>• Identify the requirements for a college system computerization.<br>• Identify the various modules in a banking system.<br>• Identify the complete design of a general grocery store.<br>• Draw the decision table for finding the greatest of three numbers.<br>• Draw to decision table for checking eligibility for admission to college in an undergraduate programme taking your assumptions. | 30 |
| **SuggestedEvaluationMethods** | | |

| | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:4<br>• Seminar/presentation/assignment/quiz/classtestetc.:NA<br>• Mid-TermExam:6<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:5<br>• Mid-TermExam: NA | **End TermExamination: A three-hour examfor both theory andpracticum. EndTermExamMarks:35(20(T)+15(P))** |
| **PartC-LearningResources** | |
| **Text/ReferenceBooks:**<br>• Sinha,P.K.&Sinha,Priti,ComputerFundamentals, BPB.<br>• Dromey, R.G.,HowtoSolveitByComputer, PHI.<br>• Norton,Peter,IntroductiontoComputer,McGraw-Hill.<br>• Leon, Alexis &Leon, Mathews, IntroductiontoComputers,LeonTechWorld.<br>• Rajaraman,V.,FundamentalsofComputers,PHI. | |

*Applicablefor courseshavingpracticalcomponents.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONSKURUKSHETRAUNIVERSITY, KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | COMPUTERSCIENCE | | |
| Semester | II | | |
| Nameofthe Course | Web Technologies Fundamentals | | |
| CourseCode | B23-CSE-204 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | MDC | | |
| Level of the course (As perAnnexure-I | 100-199 | | |
| Pre-requisiteforthecourse(ifany) | | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,thelearner willbeableto:<br>1. learnthebasicsofweb development.<br>2. understand different types of web pages and websites.<br>3. implementHTML and CSS for web page designing.<br>4. Understand the design of web crawlers and search engines.<br>5*. implement the programs based on variousweb development concepts. | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| ContactHours | 2 | 2 | 4 |
| **Max.Marks:75(50(T)+25(P))**<br>**InternalAssessmentMarks:20(15(T)+5(P))**<br>**EndTermExamMarks:55(35(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |

**PartB-ContentsoftheCourse**

**InstructionsforPaper-Setter**

The examiner will set a total of nine questions. Out of which, the first question will be compulsory.The remaining eight questions will be set from four units selecting two questions from each unit.The examination will be of three-hour duration. All questions will carry equal marks. The first questionwill compriseshort answer-typequestions coveringthe entiresyllabus.

The candidatemust attempt five questions, selecting one from each unit. The firstquestionwillbecompulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be ofthree-hourduration.

| **Unit** | **Topics** | **Contact** |
|---|---|---|

| | | Hours |
|---|---|---|
| I | Introduction to Internet and World Wide Web (WWW); Evolution and History of World Wide Web, Web Pages and Contents, Web Clients, Web Servers, Web Browsers; Hypertext Transfer Protocol, URLs; Searching, Search Engines and Search Tools. | 7 |
| II | Web Publishing: Hosting website; Internet Service Provider; Planning and designing website; Web Graphics Design, stepsfor Developing website<br>Creating a Website and Introduction to Markup Languages (HTML and DHTML), | 7 |
| III | HTML Document Features & Fundamentals, HTML Elements, Creating Links; Headers; Text styles; Text Structuring; Text color and Background; Formatting text; Page layouts, Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes, HTML5 | 8 |
| IV | Introduction to CSS (Cascading Style Sheets): Features, Core Syntax, Types, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Positioning, and other useful Style Properties; Features of CSS3. Introduction to Client–Side Programming | 8 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limitedtobut includingthefollowingtypes ofproblems:<br>• Create a web page using an ordered list and an unordered list.<br>• Design a web page to show your institute with hyperlinks.<br>• Design a blog-style personal website.<br>• Create your resume on an HTML page.<br>• Create a web page and divide the web page into four frames. In one frame create three links that will display different HTML forms in the remaining three frames respectively.<br>• Create a web page to show the college records in the form of a table.<br>• Write anHTML code to add internal CSS on a webpage<br>• Design a web page to display your college with hyperlinks.<br>• Write a JavaScript function to calculate the sum of two numbers.<br>• Write a CSS file and attachit to any 3 HTML web pages.<br>• Use Div and span in a page and color two words with the same colors.<br>• Using HTML, and CSS create a styled checkbox with animation on state change. | 30 |
| **SuggestedEvaluationMethods** | | |

| | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:4<br>• Seminar/presentation/assignment/quiz/classtestetc.:4<br>• Mid-TermExam:7<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:5<br>• Mid-Term Exam: NA | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExamMarks:55(35(T)+20(P))** |
| **PartC-LearningResources** | |
| **RecommendedBooks/e-resources/LMS:**<br>• Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.<br>• Ramesh Bangia, Multimedia and Web Technology, Firewall Media.<br>• Thomas A. Powell, Web Design: The Complete Reference, Tata McGraw-Hill<br>• Wendy Willard, HTML Beginners Guide, Tata McGraw-Hill.<br>• Deitel and Goldberg, Internet and World Wide Web, How to Program, PHI<br>• David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.<br>• Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd. | |

*Applicableforcourseshavingpracticalcomponents.

# Kurukshetra University, Kurukshetra
**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योगयुक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Syllabus of Examination (4th Semester) for Under-Graduate Programmes
**Subject: Computer Science**
according to
Curriculum Framework for Under-Graduate Programmes
As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
(For the Batches Admitted From 2023-2024)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONSKURUKSHETRAUNIVERSITY, KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA–Introduction** | | | |
| Subject | COMPUTERSCIENCE | | |
| Semester | IV | | |
| Nameofthe Course | Data Management with DBMS | | |
| CourseCode | B23-CSE-401 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | CC | | |
| Level of the course (As perAnnexure-I) | 200-299 | | |
| Pre-requisiteforthecourse(ifany) | | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,thelearner willbeableto:<br>1. learn basic concepts of database along with its functions and components<br>2. understand data models.<br>3. understand SQL as a query language and Learn the concept of relational algebra and calculus.<br>**4.** acquire knowledge of advanced concepts of DBMS.<br>5*. Implement the queries based on database management. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| ContactHours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-ContentsoftheCourse** | | | |

**<u>InstructionsforPaper-Setter</u>**

The examiner will set a total of nine questions. Out of which, the first question will be compulsory.The remaining eight questions will be set from four units selecting two questions from each unit.The examination will be of three-hour duration. All questions will carry equal marks. The first questionwill compriseshort answer-typequestionscovering the entiresyllabus.
The candidate will have to attempt five questions in all, selecting one question from each unit. The firstquestionwill becompulsory.

| The practicumwillbeevaluatedbyanexternalandaninternalexaminer.The examinationwillbeof three-hourduration. | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | **Basic Concepts**: Data, Information, Records, Files, Schema and Instance etc. Limitations of File-Based Approach, Characteristics of Database Approach, Database Management System (DBMS), DBMS Functions and Components, Database Interfaces, Advantages and Disadvantages of DBMS.<br>**Database Users**: Data and Database Administrator, Role and Responsibilities of Database Administrator, Database Designers, Application Developers etc.<br>**Database System Architecture**: 1-Tier, 2-Tier & Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances, Data Independence – Logical and Physical Data Independence | 11 |
| II | **Data Models**: Hierarchical, Network, and Relational Data Models.<br>**Entity-Relationship Model**: Entity, Entity Sets, Entity Type, Attributes: Type of Attributes, Keys, Integrity Constraints, Designing of ER Diagram, Symbolic Notations for Designing, ER Diagram | 11 |
| III | **SQL**: Meaning, Purpose, and Need of SQL, Data Types, SQL Components: DDL, DML, DCL and DQL, Basic Queries, Join Operations and Sub-queries, Views, Specifying Indexes. Constraints and its Implementation in SQL.<br>**Relational Algebra**: Basic Operations: Select, Project, Join, Union, Intersection, Difference, and Cartesian Product, etc.<br>**Relational Calculus**: Tuple Relational and Domain Relational Calculus. Relational Algebra Vs. Relational Calculus. | 12 |
| IV | **Relational Model**: Functional Dependency, Characteristics, Inference Rules for Functional Dependency, Types of Functional Dependency,<br>Normalization: Benefits and Need of Normalization, Normal Forms Based on Primary Keys- (1NF, 2NF, 3NF, BCNF), Multi-valued Dependencies, 4 NF, Join dependencies, 5 NF, Domain Key Normal Form. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limitedtobut includingthefollowingtypes ofproblems:<br>• Write a SQL query for creating and describing a table of the salesman in a company.<br>• Write a query to insert data into a table.<br>• Write a SQL statement to display all the information of all salesmen.<br>• Write a query that will retrieve the value of the salesman if of all salesman, getting orders from the customers in the orders table without any repeats. | 30 |

| | | |
|---|---|---|
| | • Write a SQL statement to display the name and city of the salesman, who belongs to the city of Paris.<br>• Write a SQL statement to display all the information for those customers with a grade of 200.<br>• Write a SQL statement to delete a particular record from a table<br>• Write an SQL statement that selects the highest grade for each of the cities of customers using the GROUP BY clause.<br>• Write an SQL statement thatselects the particular record using the ORDER BY clause.<br>• Write a SQL statement to prepare a list with the salesman's name, the customer's name, and their cities for the salesman and customer who belong to the same city,<br>• Write a SQL statement to know which salesman is working for which customers.<br>• Write an SQL statement to create a view of the table.<br>• Write an SQL statement to rename, update, and delete a view.<br>• Write an SQL statement to update the record in a table.<br>• Write a SQL statement to drop and truncate a table.<br>• Understanding relational model concepts<br>• Converting a table into various normal forms.<br>• Understanding various concepts of databases | |

| **SuggestedEvaluationMethods** | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExamMarks:70(50(T)+20(P))** |

| **PartC-LearningResources** |
|---|
| **RecommendedBooks/e-resources/LMS:**<br>• Elmasri&Navathe: Fundamentals of Database Systems, Pearson Education.<br>• Thomas Connolly Carolyn Begg: Database Systems, Pearson Education.<br>• Korth&Silberschatz: Database System Concept, McGraw Hill International Edition.<br>• Raghu Ramakrishnan& Johannes Gehrke: Database Management Systems, McGraw Hill.<br>• Ivan Bayross: SQL, PL/SQL- The Program Language of ORACLE, BPB Publication. |

*Applicablefor courseshavingpracticalcomponents.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONSKURUKSHETRAUNIVERSITY, KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | COMPUTERSCIENCE | | |
| Semester | IV | | |
| Nameofthe Course | Introduction to Computer System Design and Organization | | |
| CourseCode | B23-CSE-402 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | MCC | | |
| Level of the course (As perAnnexure-I | 200-299 | | |
| Pre-requisiteforthecourse(ifany) | B23-CSE-102 | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,thelearner willbeableto:<br>1. understand number systems, error detecting and correcting code, and representations of numbers in a computer system.<br>2. understand computer arithmetic and Boolean algebra and simplification of Boolean expressions.<br>3. understand the working of logic gates and design various combinational circuits using these logic gates.<br>4. understand the working of different types of flip-flops and design different types of registers.<br>5*.Understand the practical aspects of computer system design and organization of computers. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| ContactHours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-ContentsoftheCourse** | | | |

**<u>InstructionsforPaper-Setter</u>**

The examiner will set a total of nine questions. Out of which the first question will be compulsory.The remaining eight questions will be set from four units selecting two questions from each unit.The examination will be of three-hour duration. All questions will carry equal marks. The first questionwill compriseshort answer-typequestionscoveringthe entiresyllabus.

The candidate will have to attempt five questions in all, selecting one question from each unit. The firstquestionwillbecompulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be ofthree-hourduration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Number Systems**: Binary, Octal, Hexadecimal, etc. Conversions from<br>one number system to another, BCD Number System. BCD Codes: Natural Binary Code, Weighted Code, Self-Complimenting Code, Cyclic Code. Error Detecting and Correcting Codes.<br>**Character representations**: ASCII, EBCDIC, and Unicode. Number Representations: Integer numbers - sign-magnitude, 1's & 2's complement representation. Real Numbers normalized floating point representations. | 11 |
| II | **Binary Arithmetic**: Binary Addition, Binary Subtraction, Binary Multiplication, Binary Division using 1's and 2's Compliment representations, Addition and subtraction with BCD representations.<br>**Boolean Algebra**: Boolean Algebra Postulates, basic Boolean Theorems, Boolean Expressions, Boolean Functions, Truth Tables, Canonical Representation of Boolean Expressions: SOP and POS, Simplification of Boolean Expressions using Boolean Postulates & Theorems, Kaurnaugh-Maps (up to four variables), Handling Don't Care conditions. | 11 |
| III | Logic Gates: Basic Logic Gates – AND, OR, NOT, Universal Gates - NAND, NOR, Other Gates – XOR, XNOR, etc. Their symbols, truth tables, and Boolean expressions.<br>Combinational Circuits: Design Procedures, Half Adder, Full Adder, Half Subtractor, Full Subtractor, Multiplexers, Demultiplexers, Decoder, Encoder, Comparators, Code Converters. | 11 |
| IV | Sequential Circuits: Basic Flip-Flops and their working. Synchronous and Asynchronous Flip –Flops, Triggering of Flip-Flops, Clocked RS, D Type, JK, T type, and Master-Slave Flip-Flops. State Table, State Diagram, and State Equations. Flip-flops characteristics & Excitation Tables.<br>Sequential Circuits: Designing registers –Serial-In Serial-Out (SISO), Serial-In Parallel-Out (SIPO), Parallel-In Serial-Out (PISO) Parallel-In Parallel-Out (PIPO), and shift registers. | 12 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to,but includingthefollowingtypes ofproblems:<br>Number System:<br>• Problems based on the Number System and their conversion.<br>• Programs based on Number System conversion.<br>Binary Arithmetic<br>• Problems based on Binary Arithmetic.<br>• Programs based on Binary Arithmetic.<br>• Problems based on Boolean Expression and their simplification | 30 |

| | | |
|---|---|---|
| | Logic Gates<br>• Understanding the working of logic Gates.<br>Combinatorial Circuits:<br>• Designing and understanding various combinational circuits.<br>Sequential Circuits:<br>• Designing and understanding various sequential circuits. | |
| **SuggestedEvaluationMethods** | | |
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExamMarks:70(50(T)+20(P))** |
| **PartC-LearningResources** | | |
| **RecommendedBooks/e-resources/LMS:**<br>• M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.<br>• V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall.<br>• Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.<br>• Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill. | | |

*Applicablefor courseshavingpracticalcomponents.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONSKURUKSHETRAUNIVERSITY, KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | COMPUTERSCIENCE | | |
| Semester | IV | | |
| Nameofthe Course | Object-Oriented Programming with Java | | |
| CourseCode | B23-CSE-403 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | MCC | | |
| Level of the course (As perAnnexure-I | 200-299 | | |
| Pre-requisiteforthecourse(ifany) | B23-CSE-101, B23-CSE-202 and B23-CSE-301. | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,thelearner willbeableto:<br>1. understand the basic concept of JAVA;<br>2. learn and develop various controls and branching of logic under various cases using language control structures<br>3. exemplify the usage to implement polymorphism and Inheritance in Java programs.<br>4. acquire knowledge of Packages, Interfaces, Exceptions, and Multithreading in building efficient applications.<br>5*.understandtheprogramming with JAVA for Object-Oriented methodologies. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| ContactHours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-ContentsoftheCourse** | | | |

**<u>InstructionsforPaper-Setter</u>**

The examiner will set a total of nine questions. Out of which, the first question will be compulsory.The remaining eight questions will be set from four units selecting two questions from each unit.The examination will be of three-hour duration. All questions will carry equal marks. The first questionwill compriseshort answer-typequestionscoveringthe entiresyllabus.

The candidate will have to attempt five questions, selecting one from each unit. The firstquestionwillbecompulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be ofthree-hourduration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Key Attributes of Object-Oriented Programming, Introduction to Java, History and Features of Java, Java Virtual Machine (JVM), JDK, Java Runtime Environment;<br>**Basic Elements**: Lexical Tokens, Identifiers, Keywords, Literals, Comments, Primitive Data types, Operators, Assignments; Input/output in Java: Basics, I/O Classes, Reading Console Input.<br>**Control Structures in Java**: Decision and Loop Control Statements. | 11 |
| II | **Class and Object in Java**: Class Fundamentals, creation of Objects, Defining Methods, Argument Passing Mechanism, Constructors, Abstract Class, Static Members.<br>**Array in Java**: Defining an Array, Initializing & Accessing Array, Multi-Dimensional Array.<br>**String**: String Fundamentals, Operations on Array and String, String Constructors, Creating Strings using String Class and StringBuffer Class. | 12 |
| III | **Polymorphism in Java**: Basic Concept, Types, Overriding vs Overloading, Run-time and Compile-time polymorphism.<br>**Inheritance**: Benefits of Inheritance, Types of Inheritance.<br>**Interface**: Implementing Interface, extending Interface. | 11 |
| IV | **Package**: creating a package, importing and using a package.<br>**Exception handling**: try/catch, handling multiple exceptions, throw/throws keyword, finally keyword, user-defined exception.<br>Concepts of Multithreading and Synchronization in Java. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited tobut includingthefollowingtypes ofproblems:<br>• WAP to find the sum of 10 numbers, entered as command line arguments.<br>• Write a program that inputs the radius and length of a cylinder and displays its area and volume. (area$A = \pi r^2$,Volume=area* length)<br>• Input a string from the user using String data type and String Buffer Class.<br>• Write a Program that demonstrates the use of various String functions.<br>• Write a program that demonstrates the use of various String Buffer functions. | 30 |

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|---|---|---|
| | • WAP to handle the Exception using try and multiple catch blocks and a finally block<br>• Write a program to illustrate the use of super keyword.<br>• Write a program to demonstrate constructor hierarchy.<br>• WAP to find the area of rectangle and circle using Interface.<br>• Write a program to demonstrate function overriding.<br>• Write a program to restrict class from overriding base class function.<br>• Write a Program for Exception Handling for Divide by zero error and Null values.<br>• WAP to implement multiple inheritance.<br>• WAP to show the concept of packages.<br>• WAP to show the working of threads in JAVA | |

| **SuggestedEvaluationMethods** | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExamMarks:70(50(T)+20(P))** |

| **PartC-LearningResources** |
|---|
| **RecommendedBooks/e-resources/LMS:**<br>● Ivor Horton, Beginning JAVA 2, WROX Publications, New Delhi<br>● Patrick Naughton and Herbert Schlitz,JAVA-2 Complete Reference,TMH, New Delhi<br>● Paul Deital& Harvey Deital, Java: How to Program, Pearson Education.<br>● Balaguruswamy, Programming with Java, TMH, New Delhi.<br>● Java6 Programming, BlackBook, KoGenT, Dreamtech Press. |

*Applicablefor courseshavingpracticalcomponents.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONSKURUKSHETRAUNIVERSITY, KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | COMPUTERSCIENCE | | |
| Semester | IV | | |
| Nameofthe Course | Front-End Development | | |
| CourseCode | B23-CSE-404 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | DSE | | |
| Level of the course (As perAnnexure-I | 200-299 | | |
| Pre-requisiteforthecourse(ifany) | B23-CSE-201 | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,thelearner willbeableto:<br>1. understand the basic concept of objects and regular expressions in JavaScript;<br>2. acquire knowledge of JavaScript events and DOM<br>3. learn to use forms and BOM in JavaScript;<br>**4.** get familiar with jQuery<br>5*.Understandtheprogramming of web pages and handling events using JavaScript and jQuery. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| ContactHours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-ContentsoftheCourse** | | | |

**<u>InstructionsforPaper-Setter</u>**

The examiner will set a total of nine questions. Out of which the first question will be compulsory.The remaining eight questions will be set from four units selecting two questions from each unit.The examination will be of three-hour duration. All questions will carry equal marks. The first questionwill compriseshort answer-typequestionscoveringthe entiresyllabus.

The candidate will have to attempt five questions, selecting one from each unit. The firstquestionwillbecompulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be ofthree-hourduration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Objects in JavaScript**: Introduction to objects, Type of objects in JavaScript, Creating objects, Object methods, Constructor function, Prototype in JavaScript, Inheritance using prototype chain.<br>**Regular Expressions**: Introduction to RegExp, Regular expression usage, Modifiers, RegExp patterns, RegExp methods, String methods for RegExp, Type conversion in JavaScript. | 11 |
| II | **Event handling**: JavaScript events, Event handler, Event flow, Event bubbling and capturing, Event listeners, Event types.<br>**Document Object Model (DOM)**: Introduction to DOM, Types of DOM, DOM standards and methods, Manipulating documents using DOM, Handling images, Table manipulation, Animation, Node and Node-list handling | 11 |
| III | **Browser Object Model (BOM)**: Introduction to BOM, DOM vs BOM differences, Window object and methods, BOM navigator, BOM history, BOM location, BOM timer, Introduction to Cookies, Session and persistent cookies.<br>**Form Handling**: Introduction to forms, Form processing, Forms object, Accessing data from forms, Form validation, Additional features in forms, Validation APIs | 12 |
| IV | **Introduction to jQuery**: jQuery Syntax, jQuery Selectors, jQuery Events, jQuery Effects, jQuery HTML, jQuery Traversing, jQuery AJAX, jQuery Misc. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited tobut includingthefollowingtypes ofproblems:<br>• Use of JavaScript in Web page designing<br>• Effective web page design<br>• Creation of Event listeners in JavaScript<br>• Update and modify website elements dynamically using asynchronously retrieved data<br>• Style HTML content with JavaScript | 30 |

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|---|---|---|
| | • Iterate over arrays and objects using JavaScript for syntax.<br>• JavaScript Program to Create Objects (4 Different Ways)<br>• JavaScript Program to Iterate Over an Object<br>• JavaScript Program to Find Max/Min Value of an Attribute in an Array of Objects<br>• JavaScript Program to Remove Duplicates from an Array of Objects<br>• Writing programs for event handling in JavaScript.<br>• Write a JavaScript function to add rows to a table.<br>• Write a JavaScript program to remove items from a drop-down list.<br>• Write a JavaScript program to calculate sphere volume.<br>• Write a JavaScript program to get the window width and height<br>• Using BOM navigation and location<br>• Creating cookies and sessions.<br>• How can you create forms and perform validations on the forms?<br>• How can you use jQuery and perform various functions using jQuery? | |

| **SuggestedEvaluationMethods** | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExamMarks:70(50(T)+20(P))** |

| **PartC-LearningResources** |
|---|
| **RecommendedBooks/e-resources/LMS:**<br>• David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.<br>• Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd.<br>• JavaScript and jQuery: Interactive Front-End Web Developmentby Jon Duckett<br>• Head First JavaScript Programming: A Brain-Friendly Guide by Elisabeth Robson and Eric Freeman |

*Applicablefor courseshavingpracticalcomponents.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONSKURUKSHETRAUNIVERSITY, KURUKSHETRA**

| **Session:2023-24** | | | |
|---|---|---|---|
| **PartA-Introduction** | | | |
| Subject | COMPUTERSCIENCE | | |
| Semester | IV | | |
| Nameofthe Course | Linux and Shell Programming | | |
| CourseCode | B23-CSE-405 | | |
| CourseType:(CC/MCC/MDC /CC-M/DSEC/VOC/DSE/PC/AEC/ VAC) | DSE | | |
| Level of the course (As perAnnexure-I | 200-299 | | |
| Pre-requisiteforthecourse(ifany) | B23-CSE-301 | | |
| CourseLearningOutcomes(CLO): | Aftercompletingthis course,thelearner willbeableto:<br>1. understand Linux architecture;<br>2. ability to use various Linux commands that are used to manipulate system operations.<br>3. acquire knowledge of Linux File System;<br>4. understand and make effective use of I/O and shell scripting language to solve problems<br>5*.Understandthe Linux operating system working and programming Shell. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| ContactHours | 3 | 2 | 5 |
| **Max.Marks:100(70(T)+30(P))**<br>**InternalAssessmentMarks:30(20(T)+10(P))**<br>**EndTermExamMarks:70(50(T)+20(P))** | | **Time:3Hrs.(T),3Hrs.(P)** | |
| **PartB-ContentsoftheCourse** | | | |

**<u>InstructionsforPaper-Setter</u>**

The examiner will set a total of nine questions. Out of which the first question will be compulsory.The remaining eight questions will be set from four units selecting two questions from each unit.The examination will be of three-hour duration. All questions will carry equal marks. The first questionwill compriseshort answer-typequestionscoveringthe entiresyllabus.

The candidate will have to attempt five questions, selecting one from each unit. The firstquestionwillbecompulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be ofthree-hourduration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Introduction to Linux**: Linux distributions, Overview of Linux operating system, Linux architecture, Features of Linux, Accessing Linux system, Starting and shutting down system, Logging in and Logging out, Comparison of Linux with other operating systems | 11 |
| II | **Commands in Linux**: General-purpose commands, File oriented commands, directory-oriented commands, Communication-oriented commands, process-oriented commands, etc.<br>**Regular expressions & Filters in Linux**: Simple filters viz. more, wc, diff, sort, uniq, grep; Introducing regular expressions | 11 |
| III | **Linux file system**: Linux files, inodes and structure and file system, file system components, standard file system, file system types.<br>**Processes in Linux**: starting and stopping processes, initialization processes, mechanism of process creation, Job control in Linux using at, batch, cron& time | 11 |
| IV | **Shell Programming**: vi editor, shell variables, I/O in shell, control structures, loops, subprograms, creating & executing shell scripts in Linux | 12 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited tobut includingthefollowingtypes ofproblems:<br>• Basic Linux command<br>• Basic Shell Programming (Fibonacci Series generation, Factorial of a given number, Checking for Armstrong number)<br>• Designing an Arithmetic calculator<br>• Generation of Multiplication table<br>• Base Conversion (Decimal to Binary, Binary to Decimal)<br>• Finding the information about the Login name and File name.<br>• Write a shell script to exchange the contents of two variables.<br>• Write a shell script, which accepts three subject marks scored by a student and declares the result.<br>• Write a shell script program to find the area of a square, rectangle, circle, and triangle.<br>• Write a shell script to print integer numbers from 1 to 20. | 30 |

| SuggestedEvaluationMethods | |
|---|---|
| **InternalAssessment:**<br>➢ **Theory**<br>• ClassParticipation:5<br>• Seminar/presentation/assignment/quiz/classtestetc.:5<br>• Mid-TermExam:10<br>➢ **Practicum**<br>• ClassParticipation:NA<br>• Seminar/Demonstration/Viva-voce/Labrecordsetc.:10<br>• Mid-TermExam: NA | **End-TermExamination:**A three-hourexam for boththeory andpracticum.<br>**EndTermExamMarks:70(50(T)+20(P))** |

| PartC-LearningResources |
| --- |
| **RecommendedBooks/e-resources/LMS:**<br>● Kanetkar, UNIX & Shell programming – BPB.<br>● M.G.Venkateshmurthy, Introduction to UNIX & Shell Programming, Pearson Education.<br>● Richard Petersen, The Complete Reference – Linux, McGraw-Hill.<br>● Stephen Prata, Advanced UNIX – A programmer's Guide, SAMS.<br>● Sumitabha Das, Your UNIX - The Ultimate Guide, Tata McGraw-Hill |

*Applicablefor courseshavingpracticalcomponents.

# Kurukshetra University, Kurukshetra

**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योग युक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Syllabus of Examination (2nd Semester) for Under-Graduate Programmes

**Bachelor of Computer Applications**
**(Cloud Technology & Information Security)**
**BCA (CTIS)**

according to
Curriculum Framework for Under-Graduate Programmes
As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

(For the Batches Admitted From 2023-2024)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Cloud Technology and Information Security) | | |
| Semester | II | | |
| Name of the Course | Object Oriented Programming using C++ | | |
| Course Code | B23-CTS-201 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | B23-CTS-101 | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn the input/output statements and functions in C++.<br>2. get familiar with OOPS concepts, constructors, and destructors in C++.<br>3. Learn the various concepts of operator overloading and inheritance.<br>4. get familiar with concepts of virtual functions and exception handling in C++ language.<br>5*. implement the programs based on various concepts of C++. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**<u>Instructions for Paper-Setter</u>**

The examiner will set a total of nine questions. Out of which, the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate will have to attempt five questions, selecting one from each unit. First

question will be compulsory.
The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Input Output in C++**: Unformatted and Formatted I/O Operations. I/O using insertion and extraction operators and streams in C++.<br>**Functions**: Declaration and Definition, return values, arguments, passing parameters by value, call by reference, call by pointer, Recursion, Inline Functions, Function overloading.<br>Pointers, structures, and union in C++. | 11 |
| II | **Object-oriented features of C++**: Class and Objects, Data hiding and encapsulation, abstraction, Data Members and Member Functions, accessing class members, empty class, local class, global class, Scope Resolution Operator and its Uses, Static Data Members, Static Member Functions, Structure vs Class, Friend function and friend class.<br>**Constructors and Destructors**: Constructors, Instantiation of objects, Default constructor, Parameterized constructor, Copy constructor and its use, Destructors, Dynamic initialization of objects. | 12 |
| III | **Operator Overloading:** Overloading unary and binary operators: arithmetic operators, manipulation of strings using operators.<br>**Inheritance**: Derived class, base class, Accessing the base class member, Inheritance: multilevel, multiple, hierarchical, hybrid; Virtual base class, Abstract class. | 11 |
| IV | Virtual Functions, pure virtual functions; Polymorphism and its types<br>**Exception Handling in C++**: exception handling model, exception handling constructs - try, throw, catch, Order of catch blocks, Catching all exceptions, Nested try blocks, handling uncaught exceptions. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Write a C++ program to print the following lines:<br>  • Your introduction<br>  • Your institute introduction<br>• Write a program that accepts principle, rate, and time from the user and prints the simple interest.<br>• Write a program to swap the values of two variables.<br>• Write a program to check whether the given number is even or odd (using ?: ternary operator).<br>• Write a program to check whether the given number is positive or negative (using?: ternary operator).<br>• Write a program that inputs three numbers and displays the largest number using the ternary operator.<br>• WAP to initialize data members of the class using the constructor.<br>• Pass values to the constructor and initialize the members of that class to those values. | 30 |

| | | |
|---|---|---|
| | • Create a class called cube with the data members Length, Breadth, Height<br>  • Members functions:<br>  • To accept the details.<br>  • To calculate the volume of the cube.<br>  • To display the details.<br>• WAP to calculate the sum using constructor overloading.<br>• WAP to demonstrate the use of destructor.<br>• Create a C++ Program to show the order of constructor and destructor.<br>• C++ Program to Find the Number of Vowels, Consonants, Digits, and White Spaces in a String<br>• C++ Program to Multiply Two Matrices by Passing Matrix to Function<br>• Increment ++ and Decrement -- Operator Overloading in C++ Programming<br>• C++ Program to Add Two Complex Numbers<br>• C++ Program to Show Function Overriding<br>• C++ Program to Show Polymorphism in Class<br>• C++ Program to Show Function Overloading<br>• C++ Program to Show Inheritance | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for boththeory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Herbert Scildt, C++, The Complete Reference, Tata McGraw-Hill
- Robert Lafore, Object Oriented Programming in C++, SAMS Publishing
- Bjarne Stroustrup, The C++ Programming Language, Pearson Education
- Balaguruswami, E., Object Oriented Programming In C++, Tata McGraw-Hill.
- Richard Johnson, An Introduction to Object-Oriented Application Development, Thomson Learning.

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Cloud Technology and Information Security) | | |
| Semester | II | | |
| Name of the Course | Introduction to Web Technologies | | |
| Course Code | B23-CTS-202 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn the basics of web development.<br>2. understand different types of web pages and websites.<br>3. implement HTML and CSS for web page designing.<br>4. Understand the design of web crawlers and search engines.<br>5*. Implement the programs based on various concepts of web development. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**Instructions for Paper-Setter**

The examiner will set a total of nine questions. Out of which the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate must attempt five questions in all, selecting one question from each unit. The first question will be compulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Introduction to the Internet and World Wide Web (WWW); Evolution and History of World Wide Web, Web Pages and Contents, Web Clients, Web Servers, Web Browsers; Hypertext Transfer Protocol, URLs; Searching, Search Engines and Search Tools.<br>Web Publishing: Hosting website; Internet Service Provider; Planning and designing website; Web Graphics Design, Steps For Developing website | 11 |
| II | Creating a Website and Introduction to Markup Languages (HTML and DHTML), HTML Document Features and fundamentals, HTML Elements, Creating Links; Headers; Text styles; Text Structuring; Text color and Background; Formatting text; Page layouts, Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes, HTML5 | 11 |
| III | Introduction to CSS (Cascading Style Sheets): Features, Core Syntax, Types, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Positioning, and other useful Style Properties; Features of CSS3. | 12 |
| IV | The Nature of JavaScript: Evolution of Scripting Languages, JavaScript-Definition, Programming for Non-Programmers, Introduction to Client–Side Programming, Enhancing HTML Documents with JavaScript. Static and Dynamic web pages | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Create a web page using an ordered list and an unordered list.<br>• Design a web page to show your institute with hyperlinks.<br>• Create your resume on the HTML page.<br>• Create a web page and divide the web page into four frames. In one frame create three links that will display different HTML forms in the remaining three frames respectively.<br>• Create a web page to show the record of the college in the form of a table.<br>• Write an HTML code to add internal CSS on a webpage<br>• Design a blog-style personal website. | 30 |

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|---|---|---|
| | • Design a web page to display your college with hyperlinks.<br>• Write a JavaScript function to calculate the sum of two numbers.<br>• Write a JavaScript program to find the maximum number in an array.<br>• Write a JavaScript function to check if the given string is a palindrome (reads the same forwards and backward).<br>• Write a CSS file and attach it to any 3 HTML web pages.<br>• Use Div and span in a page and color two words with the same colors.<br>• Using HTML, CSS create a styled checkbox with animation on state change<br>• Design a web page that is like a compose page of e-mail. It should have:<br>a) Text boxes for To, CC, and BCC respectively.<br>b) Text field for the message.<br>c) Send button.<br>d) Option for selecting a file for attachment<br>• After clicking the send button a new page should open with the display message "Message has been sent". | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for both theory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.
- Ramesh Bangia, Multimedia and Web Technology, Firewall Media.
- Thomas A. Powell, Web Design: The Complete Reference, Tata McGraw-Hill
- Wendy Willard, HTML Beginners Guide, Tata McGraw-Hill.
- Deitel and Goldberg, Internet and World Wide Web, How to Program, PHI
- David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.
- Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd.

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Cloud Technology and Information Security) | | |
| Semester | II | | |
| Name of the Course | Concepts of Operating Systems | | |
| Course Code | B23-CTS-203 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. understand the basic concepts of operating systems and their services along with process management.<br>2. understand the concept of process scheduling and acquire knowledge of process synchronization.<br>3. learn about memory management and virtual memory concepts.<br>4. learn to work with directory structure and security aspects.<br>5*. Implement the programs based on the operating system. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |
| **Instructions for Paper-Setter**<br>The examiner will set a total of nine questions. Out of which the first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. First question | | | |

| | | |
|---|---|---|
| will comprise short answer-type questions covering the entire syllabus.<br>The candidate must attempt five questions in all, selecting one question from each unit. The first question will be compulsory.<br>The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introductory Concepts: Operating System, Functions and Characteristics, Historical Evolution of Operating Systems, Operating System Structure.<br>Types of Operating System: Real-time, Multiprogramming, Multiprocessing, Batch processing.<br>Operating System Services, Operating System Interface, Service System Calls, and System Programs.<br>Process Management: Process Concepts, Operations on Processes, Process States, and Process Control Block. Inter-Process Communication. | 11 |
| II | CPU Scheduling: Scheduling Criteria, Levels of Scheduling, Scheduling Algorithms, Multiple Processor Scheduling, Algorithm Evaluation.<br>Synchronization: Critical Section Problem, Semaphores, Classical Problem of Synchronization, Monitors.<br>Deadlocks: Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery. | 12 |
| III | Memory Management Strategies: Memory Management of Single-user and Multiuser Operating Systems, Partitioning, Swapping, Contiguous Memory Allocation, Paging and Segmentation;<br>Virtual Memory Management: Demand Paging, Page Replacement Algorithms, Thrashing. | 11 |
| IV | Implementing File System: File System Structure, File System Implantation, File Operations, Type of Files, Directory Implementation, Allocation Methods, and Free Space Management.<br>Disk Scheduling algorithm - SSTF, Scan, C- Scan, Look, C-Look.<br>SSD Management. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Working with various operating systems, and performing different operations using operating systems.<br>• Write a program to print file details including owner access permissions, and file access time, where file name is given as argument.<br>• Write a program to copy files using system calls. | 30 |

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|---|---|---|
| | • Write a program to implement the FCFS scheduling algorithm.<br>• Write a program to implement the Round Robin scheduling algorithm.<br>• Write a program to implement the SJF scheduling algorithm.<br>• Write a program to implement a non-preemptive priority-based scheduling algorithm<br>• Write a program to implement preemptive priority-based<br>• scheduling algorithm.<br>• Write a program to implement the SRJF scheduling algorithm.<br>• Write a program to calculate the sum of n numbers using the thread library.<br>• Write a program to implement first-fit, best-fit, and worst-fit allocation strategies. | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for both theory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Silberschatz A., Galvin P.B.,and Gagne G., Operating System Concepts, John Wiley & Sons.
- Godbole, A.S., Operating Systems, Tata McGraw-Hill Publishing Company, New Delhi.
- Deitel, H.M., Operating Systems, Addison- Wesley Publishing Company, New York.
- Tanenbaum, A.S., Operating System- Design and Implementation, Prentice Hall of India, New Delhi.

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Cloud Technology and Information Security) | | |
| Semester | II | | |
| Name of the Course | Mathematical Foundations for Computer Science-II | | |
| Course Code | B23-CTS-204 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After learning this course students will be able to:<br>1. Understand the concept of integration.<br>2. Acquire cognitive and technical knowledge about a variety of methods of representation of statistical data<br>3. Understand methods of measure of central tendency. Analyze the problem and apply the best measure of central tendency to draw inferences from the available data.<br>4. Understand the concept of correlation, and correlation methods and conclude about the type of correlation for the available data. Comprehend the skills of curve fitting.<br>5. * Attain a range of cognitive and technical skills to integrate various functions. Have the technical and practical skills required for selecting and using suitable methods for data representation and measurement of central tendency. | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| Contact Hours | 1 | 2 | 3 |
| **Max. Marks:50(30(T)+20(P))**<br>**Internal Assessment Marks:15(10(T)+5(P))**<br>**End Term Exam Marks:35(20(T)+15(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B-Contents of the Course** | | | |

**Instructions for Paper-Setter**

The examiner will set a total of nine questions. Out of which the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate must attempt five questions in all, selecting one question from each unit. The first question will be compulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Integration of simple algebraic, trigonometric, and exponential functions.<br>**Presentation of data**: Frequency distribution and cumulative frequency distribution, Diagrammatic and graphical presentation of data, Construction of bar, Pie diagrams, Histograms, Frequency polygon, Frequency curve, and Ogives. | 4 |
| II | **Measures of central tendency**: Arithmetic mean, Median, Mode, Geometric mean, and Harmonic mean for ungrouped and grouped data.<br>**Measures of dispersion**: Concept of dispersion, Mean deviation and its coefficient, Range, Variance and its coefficient, Standard deviation. | 4 |
| III | **Correlation**: Concept and types of correlation, Methods of finding correlation: Scatter diagram, Karl Pearson's coefficients of correlation, Rank correlation. | 3 |
| IV | **Linear regression**: Principle of least square, Fitting of a straight line, Two lines of regression, Regression coefficients. | 4 |
| V* | **Practicum**: Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:<br>**Problem Solving**- Questions related to the practical problems based on the following topics will be worked out and a record of those will be maintained in the Practical Note Book:<br>• Demonstrate skills in finding integration of simple functions.<br>• Representation of data using Bar and pie diagrams.<br>• Representation of data using Histogram, Frequency polygon, Frequency curves, and Ogives.<br>• Problems to compute measures of central tendency.<br>• Problems to calculate measures of dispersion.<br>• Problem to calculate Karl Pearson's coefficient of correlation.<br>• Problem to fit the straight line for the given data.<br>• Problem to find lines of regression. | 30 |
| **Suggested Evaluation Methods** | | |

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: NA<br>• Mid-Term Exam: 6<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**A three-hour exam for both theory and practicum.**<br>**End Term Exam Marks:35(20(T)+15 (P))** |
| **Part C-Learning Resources** | |
| **Text /Reference Books:**<br>• S.C. Gupta and V.K. Kapoor (2014). Fundamentals of Mathematical Statistics, S. Chand & Sons, Delhi.<br>• R.V. Hogg, J. W. McKean and A. T. Craig (2013). Introduction to Mathematical Statistics (7 th edition), Pearson Education.<br>• J. V. Dyke, J. Rogers and H. Adams (2011). Fundamentals of Mathematics, Cengage Learning.<br>• A.S. Tussy, R. D. Gustafson and D. Koenig (2010). Basic Mathematics for College Students. Brooks Cole.<br>• G. Klambauer (1986). Aspects of calculus. Springer-Verlag. | |

*Applicable for courses having practical components.

# Kurukshetra University, Kurukshetra
**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योग युक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Syllabus of Examination (2nd Semester) for Under-Graduate Programmes
**Bachelor of Computer Applications (Data Science)**
**BCA (DS): SCHEME D**
according to
Curriculum Framework for Under-Graduate Programmes
As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
(For the Batches Admitted From 2023-2024)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Data Science) | | |
| Semester | II | | |
| Name of the Course | Object Oriented Programming using C++ | | |
| Course Code | B23-CDS-201 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | B23-CDS-101 | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn the input/output statements and functions in C++.<br>2. get familiar with OOPS concepts, constructors, and destructors in C++.<br>3. Learn the various concepts of operator overloading and inheritance.<br>4. get familiar with concepts of virtual functions and exception handling in C++ language.<br>5*. Implement the programs based on various concepts of C++. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**<u>Instructions for Paper-Setter</u>**

The examiner will set a total of nine questions. Out of which, the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate will have to attempt five questions, selecting one from each unit. First

question will be compulsory.
The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Input Output in C++**: Unformatted and Formatted I/O Operations. I/O using insertion and extraction operators and streams in C++.<br>**Functions**: Declaration and Definition, return values, arguments, passing parameters by value, call by reference, call by pointer, Recursion, Inline Functions, Function overloading.<br>Pointers, structures, and union in C++. | 11 |
| II | **Object-oriented features of C++**: Class and Objects, Data hiding and encapsulation, abstraction, Data Members and Member Functions, accessing class members, empty class, local class, global class, Scope Resolution Operator and its Uses, Static Data Members, Static Member Functions, Structure vs Class, Friend function and friend class.<br>**Constructors and Destructors**: Constructors, Instantiation of objects, Default constructor, Parameterized constructor, Copy constructor and its use, Destructors, Dynamic initialization of objects. | 12 |
| III | **Operator Overloading:** Overloading unary and binary operators: arithmetic operators, manipulation of strings using operators.<br>**Inheritance**: Derived class, base class, Accessing the base class member, Inheritance: multilevel, multiple, hierarchical, hybrid; Virtual base class, Abstract class. | 11 |
| IV | Virtual Functions, pure virtual functions; Polymorphism and its types<br>**Exception Handling in C++**: exception handling model, exception handling constructs - try, throw, catch, Order of catch blocks, Catching all exceptions, Nested try blocks, handling uncaught exceptions. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Write a C++ program to print the following lines:<br>  • Your introduction<br>  • Your institute introduction<br>• Write a program that accepts principle, rate, and time from the user and prints the simple interest.<br>• Write a program to swap the values of two variables.<br>• Write a program to check whether the given number is even or odd (using ?: ternary operator).<br>• Write a program to check whether the given number is positive or negative (using?: ternary operator).<br>• Write a program that inputs three numbers and displays the largest number using the ternary operator.<br>• WAP to initialize data members of the class using the constructor.<br>• Pass values to the constructor and initialize the members of that class to those values. | 30 |

| | | |
|---|---|---|
| | • Create a class called cube with the data members Length, Breadth, Height<br>  • Members functions:<br>  • To accept the details.<br>  • To calculate the volume of the cube.<br>  • To display the details.<br>• WAP to calculate the sum using constructor overloading.<br>• WAP to demonstrate the use of destructor.<br>• Create a C++ Program to show the order of constructor and destructor.<br>• C++ Program to Find the Number of Vowels, Consonants, Digits, and White Spaces in a String<br>• C++ Program to Multiply Two Matrices by Passing Matrix to Function<br>• Increment ++ and Decrement -- Operator Overloading in C++ Programming<br>• C++ Program to Add Two Complex Numbers<br>• C++ Program to Show Function Overriding<br>• C++ Program to Show Polymorphism in Class<br>• C++ Program to Show Function Overloading<br>• C++ Program to Show Inheritance | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for boththeory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Herbert Scildt, C++, The Complete Reference, Tata McGraw-Hill
- Robert Lafore, Object Oriented Programming in C++, SAMS Publishing
- Bjarne Stroustrup, The C++ Programming Language, Pearson Education
- Balaguruswami, E., Object Oriented Programming In C++, Tata McGraw-Hill.
- Richard Johnson, An Introduction to Object-Oriented Application Development, Thomson Learning.

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Data Science) | | |
| Semester | II | | |
| Name of the Course | Introduction to Web Technologies | | |
| Course Code | B23-CDS-202 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn the basics of web development.<br>2. understand different types of web pages and websites.<br>3. implement HTML and CSS for web page designing.<br>4. Understand the design of web crawlers and search engines.<br>5*. implement the programs based on various concepts of web development. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**<u>Instructions for Paper- Setter</u>**

Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.

Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.

Practicum will be evaluated by an external and an internal examiner. Examination will be of

| three-hour duration. | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Internet and World Wide Web (WWW); Evolution and History of World Wide Web, Web Pages and Contents, Web Clients, Web Servers, Web Browsers; Hypertext Transfer Protocol, URLs; Searching, Search Engines and Search Tools.<br>Web Publishing: Hosting website; Internet Service Provider; Planning and designing website; Web Graphics Design, Steps For Developing website | 11 |
| II | Creating a Website and Introduction to Markup Languages (HTML and DHTML), HTML Document Features and fundamentals, HTML Elements, Creating Links; Headers; Text styles; Text Structuring; Text color and Background; Formatting text; Page layouts, Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes, HTML5 | 11 |
| III | Introduction to CSS (Cascading Style Sheets): Features, Core Syntax, Types, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Positioning, and other useful Style Properties; Features of CSS3. | 12 |
| IV | The Nature of JavaScript: Evolution of Scripting Languages, JavaScript-Definition, Programming for Non-Programmers, Introduction to Client–Side Programming, Enhancing HTML Documents with JavaScript. Static and Dynamic web pages | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Create a web page using an ordered list and an unordered list.<br>• Design a web page to show your institute with hyperlinks.<br>• Create your resume on the HTML page.<br>• Create a web page and divide the web page into four frames. In one frame create three links that will display different HTML forms in the remaining three frames respectively.<br>• Create a web page to show the record of the college in the form of a table.<br>• Write an HTML code to add internal CSS on a webpage<br>• Design a blog-style personal website. | 30 |

| | | |
|---|---|---|
| | • Design a web page to display your college with hyperlinks.<br>• Write a JavaScript function to calculate the sum of two numbers.<br>• Write a JavaScript program to find the maximum number in an array.<br>• Write a JavaScript function to check if the given string is a palindrome (reads the same forwards and backward).<br>• Write a CSS file and attach it to any 3 HTML web pages.<br>• Use Div and span in a page and color two words with the same colors.<br>• Using HTML, CSS create a styled checkbox with animation on state change<br>• Design a web page that is like a compose page of e-mail. It should have:<br>a) Text boxes for To, CC, and BCC respectively.<br>b) Text field for the message.<br>c) Send button.<br>d) Option for selecting a file for attachment<br>• After clicking the send button a new page should open with the display message "Message has been sent". | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for both theory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.
- Ramesh Bangia, Multimedia and Web Technology, Firewall Media.
- Thomas A. Powell, Web Design: The Complete Reference, Tata McGraw-Hill
- Wendy Willard, HTML Beginners Guide, Tata McGraw-Hill.
- Deitel and Goldberg, Internet and World Wide Web, How to Program, PHI
- David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.
- Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd.

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Data Science) | | |
| Semester | II | | |
| Name of the Course | Concepts of Operating Systems | | |
| Course Code | B23-CDS-203 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. understand the basic concepts of operating systems and their services along with process management.<br>2. understand the concept of process scheduling and acquire knowledge of process synchronization.<br>3. learn about memory management and virtual memory concepts.<br>4. learn to work with directory structure and security aspects.<br>5*. implement the programs based on the operating system. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |
| **Instructions for Paper- Setter**<br>Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question | | | |

| | | |
|---|---|---|
| will comprise short answer-type questions covering the entire syllabus.<br>The candidate must attempt five questions in all, selecting one question from each unit. The first question will be compulsory.<br>The practicum will be evaluated by an external and an internal examiner. The examination will be ofthree-hour duration. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introductory Concepts: Operating System, Functions and Characteristics, Historical Evolution of Operating Systems, Operating System Structure.<br>Types of Operating System: Real-time, Multiprogramming, Multiprocessing, Batch processing.<br>Operating System Services, Operating System Interface, Service System Calls, and System Programs.<br>Process Management: Process Concepts, Operations on Processes, Process States, and Process Control Block. Inter-Process Communication. | 11 |
| II | CPU Scheduling: Scheduling Criteria, Levels of Scheduling, Scheduling Algorithms, Multiple Processor Scheduling, Algorithm Evaluation.<br>Synchronization: Critical Section Problem, Semaphores, Classical Problem of Synchronization, Monitors.<br>Deadlocks: Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery. | 12 |
| III | Memory Management Strategies: Memory Management of Single-user and Multiuser Operating Systems, Partitioning, Swapping, Contiguous Memory Allocation, Paging and Segmentation;<br>Virtual Memory Management: Demand Paging, Page Replacement Algorithms, Thrashing. | 11 |
| IV | Implementing File System: File System Structure, File System Implantation, File Operations, Type of Files, Directory Implementation, Allocation Methods, and Free Space Management.<br>Disk Scheduling algorithm - SSTF, Scan, C- Scan, Look, C-Look.<br>SSD Management. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Working with various operating systems, and performing different operations using operating systems.<br>• Write a program to print file details including owner access permissions, and file access time, where file name is given as argument.<br>• Write a program to copy files using system calls. | 30 |

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|---|---|---|
| | • Write a program to implement the FCFS scheduling algorithm.<br>• Write a program to implement the Round Robin scheduling algorithm.<br>• Write a program to implement the SJF scheduling algorithm.<br>• Write a program to implement a non-preemptive priority-based scheduling algorithm<br>• Write a program to implement preemptive priority-based<br>• scheduling algorithm.<br>• Write a program to implement the SRJF scheduling algorithm.<br>• Write a program to calculate the sum of n numbers using the thread library.<br>• Write a program to implement first-fit, best-fit, and worst-fit allocation strategies. | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for both theory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Silberschatz A., Galvin P.B.,and Gagne G., Operating System Concepts, John Wiley & Sons.
- Godbole, A.S., Operating Systems, Tata McGraw-Hill Publishing Company, New Delhi.
- Deitel, H.M., Operating Systems, Addison- Wesley Publishing Company, New York.
- Tanenbaum, A.S., Operating System- Design and Implementation, Prentice Hall of India, New Delhi.

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Data Science) | | |
| Semester | II | | |
| Name of the Course | Mathematical Foundations for Computer Science-II | | |
| Course Code | B23-CDS-204 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After learning this course students will be able to:<br>1. Understand the concept of integration.<br>2. Acquire cognitive and technical knowledge about a variety of methods of representation of statistical data<br>3. Understand methods of measure of central tendency. Analyze the problem and apply the best measure of central tendency to draw inferences from the available data.<br>4. Understand the concept of correlation, and correlation methods and conclude about the type of correlation for the available data. Comprehend the skills of curve fitting.<br>5. * Attain a range of cognitive and technical skills to integrate various functions. Have the technical and practical skills required for selecting and using suitable methods for data representation and measurement of central tendency. | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| Contact Hours | 1 | 2 | 3 |
| **Max. Marks:50(30(T)+20(P))**<br>**Internal Assessment Marks:15(10(T)+5(P))**<br>**End Term Exam Marks:35(20(T)+15(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B-Contents of the Course** | | | |

**Instructions for Paper-Setter**

The examiner will set a total of nine questions. Out of which the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate must attempt five questions in all, selecting one question from each unit. The first question will be compulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Integration of simple algebraic, trigonometric, and exponential functions.<br>**Presentation of data**: Frequency distribution and cumulative frequency distribution, Diagrammatic and graphical presentation of data, Construction of bar, Pie diagrams, Histograms, Frequency polygon, Frequency curve, and Ogives. | 4 |
| II | **Measures of central tendency**: Arithmetic mean, Median, Mode, Geometric mean, and Harmonic mean for ungrouped and grouped data.<br>**Measures of dispersion**: Concept of dispersion, Mean deviation and its coefficient, Range, Variance and its coefficient, Standard deviation. | 4 |
| III | **Correlation**: Concept and types of correlation, Methods of finding correlation: Scatter diagram, Karl Pearson's coefficients of correlation, Rank correlation. | 3 |
| IV | **Linear regression**: Principle of least square, Fitting of a straight line, Two lines of regression, Regression coefficients. | 4 |
| V* | **Practicum**: Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:<br>**Problem Solving**- Questions related to the practical problems based on the following topics will be worked out and a record of those will be maintained in the Practical Note Book:<br>• Demonstrate skills in finding integration of simple functions.<br>• Representation of data using Bar and pie diagrams.<br>• Representation of data using Histogram, Frequency polygon, Frequency curves, and Ogives.<br>• Problems to compute measures of central tendency.<br>• Problems to calculate measures of dispersion.<br>• Problem to calculate Karl Pearson's coefficient of correlation.<br>• Problem to fit the straight line for the given data.<br>• Problem to find lines of regression. | 30 |
| **Suggested Evaluation Methods** | | |

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: NA<br>• Mid-Term Exam: 6<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**A three-hour exam for both theory and practicum.**<br>**End Term Exam Marks:35(20(T)+15 (P))** |
| **Part C-Learning Resources** | |
| **Text /Reference Books:**<br>• S.C. Gupta and V.K. Kapoor (2014). Fundamentals of Mathematical Statistics, S. Chand & Sons, Delhi.<br>• R.V. Hogg, J. W. McKean and A. T. Craig (2013). Introduction to Mathematical Statistics (7 th edition), Pearson Education.<br>• J. V. Dyke, J. Rogers and H. Adams (2011). Fundamentals of Mathematics, Cengage Learning.<br>• A.S. Tussy, R. D. Gustafson and D. Koenig (2010). Basic Mathematics for College Students. Brooks Cole.<br>• G. Klambauer (1986). Aspects of calculus. Springer-Verlag. | |

*Applicable for courses having practical components.

# Kurukshetra University, Kurukshetra
**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योग युक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Syllabus of Examination (2nd Semester) for Under-Graduate Programmes
**Bachelor of Computer Applications (Artificial Intelligence)**
**BCA (AI): SCHEME D**
according to
Curriculum Framework for Under-Graduate Programmes
As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
(For the Batches Admitted From 2023-2024)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Artificial Intelligence) | | |
| Semester | II | | |
| Name of the Course | Object Oriented Programming using C++ | | |
| Course Code | B23-CAL-201 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | B23-CAL-101 | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn the input/output statements and functions in C++.<br>2. get familiar with OOPS concepts, constructors, and destructors in C++.<br>3. Learn the various concepts of operator overloading and inheritance.<br>4. get familiar with concepts of virtual functions and exception handling in C++ language.<br>5*. implement the programs based on various concepts of C++. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |
| **Instructions for Paper-Setter**<br>The examiner will set a total of nine questions. Out of which, the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate will have to attempt five questions, selecting one from each unit. First | | | |

question will be compulsory.
The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Input Output in C++**: Unformatted and Formatted I/O Operations. I/O using insertion and extraction operators and streams in C++.<br>**Functions**: Declaration and Definition, return values, arguments, passing parameters by value, call by reference, call by pointer, Recursion, Inline Functions, Function overloading.<br>Pointers, structures, and union in C++. | 11 |
| II | **Object-oriented features of C++**: Class and Objects, Data hiding and encapsulation, abstraction, Data Members and Member Functions, accessing class members, empty class, local class, global class, Scope Resolution Operator and its Uses, Static Data Members, Static Member Functions, Structure vs Class, Friend function and friend class.<br>**Constructors and Destructors**: Constructors, Instantiation of objects, Default constructor, Parameterized constructor, Copy constructor and its use, Destructors, Dynamic initialization of objects. | 12 |
| III | **Operator Overloading:** Overloading unary and binary operators: arithmetic operators, manipulation of strings using operators.<br>**Inheritance**: Derived class, base class, Accessing the base class member, Inheritance: multilevel, multiple, hierarchical, hybrid; Virtual base class, Abstract class. | 11 |
| IV | Virtual Functions, pure virtual functions; Polymorphism and its types<br>**Exception Handling in C++**: exception handling model, exception handling constructs - try, throw, catch, Order of catch blocks, Catching all exceptions, Nested try blocks, handling uncaught exceptions. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Write a C++ program to print the following lines:<br>  • Your introduction<br>  • Your institute introduction<br>• Write a program that accepts principle, rate, and time from the user and prints the simple interest.<br>• Write a program to swap the values of two variables.<br>• Write a program to check whether the given number is even or odd (using ?: ternary operator).<br>• Write a program to check whether the given number is positive or negative (using?: ternary operator).<br>• Write a program that inputs three numbers and displays the largest number using the ternary operator.<br>• WAP to initialize data members of the class using the constructor.<br>• Pass values to the constructor and initialize the members of that class to those values. | 30 |

| | | |
|---|---|---|
| | • Create a class called cube with the data members Length, Breadth, Height<br>  • Members functions:<br>  • To accept the details.<br>  • To calculate the volume of the cube.<br>  • To display the details.<br>• WAP to calculate the sum using constructor overloading.<br>• WAP to demonstrate the use of destructor.<br>• Create a C++ Program to show the order of constructor and destructor.<br>• C++ Program to Find the Number of Vowels, Consonants, Digits, and White Spaces in a String<br>• C++ Program to Multiply Two Matrices by Passing Matrix to Function<br>• Increment ++ and Decrement -- Operator Overloading in C++ Programming<br>• C++ Program to Add Two Complex Numbers<br>• C++ Program to Show Function Overriding<br>• C++ Program to Show Polymorphism in Class<br>• C++ Program to Show Function Overloading<br>• C++ Program to Show Inheritance | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for boththeory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Herbert Scildt, C++, The Complete Reference, Tata McGraw-Hill
- Robert Lafore, Object Oriented Programming in C++, SAMS Publishing
- Bjarne Stroustrup, The C++ Programming Language, Pearson Education
- Balaguruswami, E., Object Oriented Programming In C++, Tata McGraw-Hill.
- Richard Johnson, An Introduction to Object-Oriented Application Development, Thomson Learning.

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Artificial Intelligence) | | |
| Semester | II | | |
| Name of the Course | Introduction to Web Technologies | | |
| Course Code | B23-CAL-202 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn the basics of web development.<br>2. understand different types of web pages and websites.<br>3. implement HTML and CSS for web page designing.<br>4. Understand the design of web crawlers and search engines.<br>5*. implement the programs based on various concepts of web development. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**Instructions for Paper- Setter**

Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.

Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.

Practicum will be evaluated by an external and an internal examiner. Examination will be of

| three-hour duration. | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to the Internet and World Wide Web (WWW); Evolution and History of World Wide Web, Web Pages and Contents, Web Clients, Web Servers, Web Browsers; Hypertext Transfer Protocol, URLs; Searching, Search Engines and Search Tools.<br>Web Publishing: Hosting website; Internet Service Provider; Planning and designing website; Web Graphics Design, Steps For Developing website | 11 |
| II | Creating a Website and Introduction to Markup Languages (HTML and DHTML), HTML Document Features and fundamentals, HTML Elements, Creating Links; Headers; Text styles; Text Structuring; Text color and Background; Formatting text; Page layouts, Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes, HTML5 | 11 |
| III | Introduction to CSS (Cascading Style Sheets): Features, Core Syntax, Types, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Positioning, and other useful Style Properties; Features of CSS3. | 12 |
| IV | The Nature of JavaScript: Evolution of Scripting Languages, JavaScript-Definition, Programming for Non-Programmers, Introduction to Client–Side Programming, Enhancing HTML Documents with JavaScript. Static and Dynamic web pages | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Create a web page using an ordered list and an unordered list.<br>• Design a web page to show your institute with hyperlinks.<br>• Create your resume on the HTML page.<br>• Create a web page and divide the web page into four frames. In one frame create three links that will display different HTML forms in the remaining three frames respectively.<br>• Create a web page to show the record of the college in the form of a table.<br>• Write an HTML code to add internal CSS on a webpage<br>• Design a blog-style personal website. | 30 |

| | | |
|---|---|---|
| | • Design a web page to display your college with hyperlinks.<br>• Write a JavaScript function to calculate the sum of two numbers.<br>• Write a JavaScript program to find the maximum number in an array.<br>• Write a JavaScript function to check if the given string is a palindrome (reads the same forwards and backward).<br>• Write a CSS file and attach it to any 3 HTML web pages.<br>• Use Div and span in a page and color two words with the same colors.<br>• Using HTML, CSS create a styled checkbox with animation on state change<br>• Design a web page that is like a compose page of e-mail. It should have:<br>a) Text boxes for To, CC, and BCC respectively.<br>b) Text field for the message.<br>c) Send button.<br>d) Option for selecting a file for attachment<br>• After clicking the send button a new page should open with the display message "Message has been sent". | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for both theory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.
- Ramesh Bangia, Multimedia and Web Technology, Firewall Media.
- Thomas A. Powell, Web Design: The Complete Reference, Tata McGraw-Hill
- Wendy Willard, HTML Beginners Guide, Tata McGraw-Hill.
- Deitel and Goldberg, Internet and World Wide Web, How to Program, PHI
- David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.
- Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd.

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Artificial Intelligence) | | |
| Semester | II | | |
| Name of the Course | Concepts of Operating Systems | | |
| Course Code | B23-CAL-203 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. understand the basic concepts of operating systems and their services along with process management.<br>2. understand the concept of process scheduling and acquire knowledge of process synchronization.<br>3. learn about memory management and virtual memory concepts.<br>4. learn to work with directory structure and security aspects.<br>5*. implement the programs based on the operating system. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**Instructions for Paper-Setter**

The examiner will set a total of nine questions. Out of which the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. First question will comprise short answer-type questions covering the entire syllabus.

The candidate must attempt five questions in all, selecting one question from each unit. First question will be compulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Introductory Concepts: Operating System, Functions and Characteristics, Historical Evolution of Operating Systems, Operating System Structure.<br>Types of Operating System: Real-time, Multiprogramming, Multiprocessing, Batch processing.<br>Operating System Services, Operating System Interface, Service System Calls, and System Programs.<br>Process Management: Process Concepts, Operations on Processes, Process States, and Process Control Block. Inter-Process Communication. | 11 |
| II | CPU Scheduling: Scheduling Criteria, Levels of Scheduling, Scheduling Algorithms, Multiple Processor Scheduling, Algorithm Evaluation.<br>Synchronization: Critical Section Problem, Semaphores, Classical Problem of Synchronization, Monitors.<br>Deadlocks: Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery. | 12 |
| III | Memory Management Strategies: Memory Management of Single-user and Multiuser Operating Systems, Partitioning, Swapping, Contiguous Memory Allocation, Paging and Segmentation;<br>Virtual Memory Management: Demand Paging, Page Replacement Algorithms, Thrashing. | 11 |
| IV | Implementing File System: File System Structure, File System Implantation, File Operations, Type of Files, Directory Implementation, Allocation Methods, and Free Space Management.<br>Disk Scheduling algorithm - SSTF, Scan, C- Scan, Look, C-Look.<br>SSD Management. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Working with various operating systems, and performing different operations using operating systems.<br>• Write a program to print file details including owner access permissions, and file access time, where file name is given as argument.<br>• Write a program to copy files using system calls. | 30 |

| | | |
|---|---|---|
| | • Write a program to implement the FCFS scheduling algorithm.<br>• Write a program to implement the Round Robin scheduling algorithm.<br>• Write a program to implement the SJF scheduling algorithm.<br>• Write a program to implement a non-preemptive priority-based scheduling algorithm<br>• Write a program to implement preemptive priority-based<br>• scheduling algorithm.<br>• Write a program to implement the SRJF scheduling algorithm.<br>• Write a program to calculate the sum of n numbers using the thread library.<br>• Write a program to implement first-fit, best-fit, and worst-fit allocation strategies. | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for both theory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Silberschatz A., Galvin P.B.,and Gagne G., Operating System Concepts, John Wiley & Sons.
- Godbole, A.S., Operating Systems, Tata McGraw-Hill Publishing Company, New Delhi.
- Deitel, H.M., Operating Systems, Addison- Wesley Publishing Company, New York.
- Tanenbaum, A.S., Operating System- Design and Implementation, Prentice Hall of India, New Delhi.

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | BCA (Artificial Intelligence) | | |
| Semester | II | | |
| Name of the Course | Mathematical Foundations for Computer Science-II | | |
| Course Code | B23-CAL-204 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After learning this course students will be able to:<br>1. Understand the concept of integration.<br>2. Acquire cognitive and technical knowledge about a variety of methods of representation of statistical data<br>3. Understand methods of measure of central tendency. Analyze the problem and apply the best measure of central tendency to draw inferences from the available data.<br>4. Understand the concept of correlation, and correlation methods and conclude about the type of correlation for the available data. Comprehend the skills of curve fitting.<br>5. * Attain a range of cognitive and technical skills to integrate various functions. Have the technical and practical skills required for selecting and using suitable methods for data representation and measurement of central tendency. | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| Contact Hours | 1 | 2 | 3 |
| **Max. Marks:50(30(T)+20(P))**<br>**Internal Assessment Marks:15(10(T)+5(P))**<br>**End Term Exam Marks:35(20(T)+15(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B-Contents of the Course** | | | |

**Instructions for Paper-Setter**

The examiner will set a total of nine questions. Out of which the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate must attempt five questions in all, selecting one question from each unit. The first question will be compulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Integration of simple algebraic, trigonometric, and exponential functions.<br>**Presentation of data**: Frequency distribution and cumulative frequency distribution, Diagrammatic and graphical presentation of data, Construction of bar, Pie diagrams, Histograms, Frequency polygon, Frequency curve, and Ogives. | 4 |
| II | **Measures of central tendency**: Arithmetic mean, Median, Mode, Geometric mean, and Harmonic mean for ungrouped and grouped data.<br>**Measures of dispersion**: Concept of dispersion, Mean deviation and its coefficient, Range, Variance and its coefficient, Standard deviation. | 4 |
| III | **Correlation**: Concept and types of correlation, Methods of finding correlation: Scatter diagram, Karl Pearson's coefficients of correlation, Rank correlation. | 3 |
| IV | **Linear regression**: Principle of least square, Fitting of a straight line, Two lines of regression, Regression coefficients. | 4 |
| V* | **Practicum**: Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:<br>**Problem Solving**- Questions related to the practical problems based on the following topics will be worked out and a record of those will be maintained in the Practical Note Book:<br>• Demonstrate skills in finding integration of simple functions.<br>• Representation of data using Bar and pie diagrams.<br>• Representation of data using Histogram, Frequency polygon, Frequency curves, and Ogives.<br>• Problems to compute measures of central tendency.<br>• Problems to calculate measures of dispersion.<br>• Problem to calculate Karl Pearson's coefficient of correlation.<br>• Problem to fit the straight line for the given data.<br>• Problem to find lines of regression. | 30 |
| **Suggested Evaluation Methods** | | |

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: NA<br>• Mid-Term Exam: 6<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**A three-hour exam for both theory and practicum.**<br>**End Term Exam Marks:35(20(T)+15 (P))** |
| **Part C-Learning Resources** | |
| **Text /Reference Books:**<br>• S.C. Gupta and V.K. Kapoor (2014). Fundamentals of Mathematical Statistics, S. Chand & Sons, Delhi.<br>• R.V. Hogg, J. W. McKean and A. T. Craig (2013). Introduction to Mathematical Statistics (7 th edition), Pearson Education.<br>• J. V. Dyke, J. Rogers and H. Adams (2011). Fundamentals of Mathematics, Cengage Learning.<br>• A.S. Tussy, R. D. Gustafson and D. Koenig (2010). Basic Mathematics for College Students. Brooks Cole.<br>• G. Klambauer (1986). Aspects of calculus. Springer-Verlag. | |

*Applicable for courses having practical components.

# Kurukshetra University, Kurukshetra
**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योग युक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Syllabus of Examination (2nd Semester) for Under-Graduate Programmes
**Subject: Computer Applications**
according to
Curriculum Framework for Under-Graduate Programmes
As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
(For the Batches Admitted From 2023-2024)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | COMPUTER APPLICATIONS | | |
| Semester | II | | |
| Name of the Course | Logical Organization of Computer | | |
| Course Code | B23-CAC-201 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | Basic Knowledge of Mathematics (10th Level) | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. understand number systems, error detecting correcting code, and representations of numbers in a computer system.<br>2. understand computer arithmetic and Boolean algebra and simplification of Boolean expressions.<br>3. understand the working of logic gates and design various combinational circuits using these logic gates.<br>4. understand the working of different types of flip-flops and design different types of registers.<br>5*. to understand the practical aspects of the logical organization of computers. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**Instructions for Paper-Setter**

The examiner will set a total of nine questions. Out of which the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise of short answer-type questions covering the entire syllabus.

| The candidate must five questions in all, selecting one question from each unit. The first question will be compulsory.<br>The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration. | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | Number Systems: Binary, Octal, Hexadecimal, etc. Conversions from one number system to another, BCD Number<br>System. BCD Codes: Natural Binary Code, Weighted Code, Self-Complimenting Code, Cyclic Code.<br>Error Detecting and Correcting Codes. Character representations: ASCII, EBCDIC, and Unicode.<br>Number Representations: Integer numbers - sign-magnitude, 1's & 2's complement representation. Real Numbers normalized floating point representations. | 11 |
| II | Binary Arithmetic: Binary Addition, Binary Subtraction, Binary Multiplication, Binary Division using 1's and 2's Compliment representations, Addition and subtraction with BCD representations.<br>Boolean Algebra: Boolean Algebra Postulates, basic Boolean Theorems, Boolean Expressions, Boolean Functions, Truth Tables, Canonical Representation of Boolean Expressions: SOP and POS, Simplification of Boolean Expressions using Boolean Postulates & Theorems, Kaurnaugh-Maps (up to four variables), Handling Don't Care conditions. | 11 |
| III | Logic Gates: Basic Logic Gates – AND, OR, NOT, Universal Gates – NAND, NOR, Other Gates – XOR, XNOR, etc. Their symbols, truth tables, and Boolean expressions.<br>Combinational Circuits: Design Procedures, Half Adder, Full Adder, Half Subtractor, Full Subtractor, Multiplexers, Demultiplexers, Decoder, Encoder, Comparators, Code Converters. | 11 |
| IV | Sequential Circuits: Basic Flip-Flops and their working. Synchronous and Asynchronous Flip–Flops, Triggering of Flip-<br>Flops, Clocked RS, D Type, JK, T type, and Master-Slave Flip-Flops. State Table, State Diagram, and State Equations.<br>Flip-flops characteristics & Excitation Tables.<br>Sequential Circuits: Designing registers –Serial-In Serial-Out (SISO), Serial-In Parallel-Out (SIPO), Parallel-In Serial-Out<br>(PISO) Parallel-In Parallel-Out (PIPO) and shift registers. | 12 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>Number System:<br>• Problems based on Number System and their conversion.<br>• Programs based on Number System conversion.<br>Binary Arithmetic<br>• Problems based on Binary Arithmetic.<br>• Programs based on Binary Arithmetic.<br>• Problems based on Boolean Expression and their simplification | 30 |

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|---|---|---|
| | Logic Gates<br>• Understanding working of logic Gates.<br>Combinatorial Circuits:<br>• Designing and understanding various combinational circuits.<br>Sequential Circuits:<br>• Designing and understanding various sequential circuits. | |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | | **End Term Examination:** A three-hour exam for both theory and practicum. **End Term Exam Marks: 70(50(T)+20(P))** |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>• M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.<br>• V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall.<br>• Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.<br>• Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill. | | |

***Applicable for courses having practical components.**

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A – Introduction** | | | |
| Subject | COMPUTER APPLICATIONS | | |
| Semester | II | | |
| Name of the Course | Data Base Management Systems | | |
| Course Code | B23-CAC-202 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | DSEC | | |
| Level of the course (As per Annexure-I) | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn basic concepts of database along with its functions and components<br>2. understand data models.<br>3. understand SQL as a query language and Learn the concept of relational algebra and calculus.<br>**4.** acquire knowledge of advanced concepts of DBMS.<br>5*. to implement the queries based on database management. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**<u>Instructions for Paper-Setter</u>**

The examiner will set a total of nine questions. Out of which, the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate must five questions in all, selecting one question from each unit. The first question will be compulsory.

| The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration. | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | **Basic Concepts**: Data, Information, Records, Files, Schema and Instance etc. Limitations of File-Based Approach, Characteristics of Database Approach, Database Management System (DBMS), DBMS Functions and Components, Database Interfaces, Advantages and Disadvantages of DBMS.<br>**Database Users**: Data and Database Administrator, Role and Responsibilities of Database Administrator, Database Designers, Application Developers etc.<br>**Database System Architecture**: 1-Tier, 2-Tier & Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances, Data Independence – Logical and Physical Data Independence | 11 |
| II | **Data Models**: Hierarchical, Network, and Relational Data Models.<br>**Entity-Relationship Model**: Entity, Entity Sets, Entity Type, Attributes: Type of Attributes, Keys, Integrity Constraints, Designing of ER Diagram, Symbolic Notations for Designing, ER Diagram | 11 |
| III | **SQL**: Meaning, Purpose, and Need of SQL, Data Types, SQL Components: DDL, DML, DCL and DQL, Basic Queries, Join Operations and Sub-queries, Views, Specifying Indexes. Constraints and its Implementation in SQL.<br>**Relational Algebra**: Basic Operations: Select, Project, Join, Union, Intersection, Difference, and Cartesian Product, etc.<br>**Relational Calculus**: Tuple Relational and Domain Relational Calculus. Relational Algebra Vs. Relational Calculus. | 12 |
| IV | **Relational Model**: Functional Dependency, Characteristics, Inference Rules for Functional Dependency, Types of Functional Dependency,<br>Normalization: Benefits and Need of Normalization, Normal Forms Based on Primary Keys- (1NF, 2NF, 3NF, BCNF), Multi-valued Dependencies, 4 NF, Join dependencies, 5 NF, Domain Key Normal Form. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Write a SQL query for creating and describing a table of the salesman in a company.<br>• Write a query to insert data into a table.<br>• Write a SQL statement to display all the information of all salesmen.<br>• Write a query that will retrieve the value of the salesman if of all salesman, getting orders from the customers in the orders table without any repeats. | 30 |

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|---|---|---|
| | • Write a SQL statement to display the name and city of the salesman, who belongs to the city of Paris.<br>• Write a SQL statement to display all the information for those customers with a grade of 200.<br>• Write a SQL statement to delete a particular record from a table<br>• Write an SQL statement that selects the highest grade for each of the cities of customers using the GROUP BY clause.<br>• Write an SQL statement that selects the particular record using the ORDER BY clause.<br>• Write a SQL statement to prepare a list with the salesman's name, the customer's name, and their cities for the salesman and customer who belong to the same city,<br>• Write a SQL statement to know which salesman is working for which customers.<br>• Write an SQL statement to create a view of the table.<br>• Write an SQL statement to rename, update, and delete a view.<br>• Write an SQL statement to update the record in a table.<br>• Write a SQL statement to drop and truncate a table.<br>• Understanding relational model concepts<br>• Converting a table into various normal forms.<br>• Understanding various concepts of databases | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for both theory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Elmasri & Navathe: Fundamentals of Database Systems, Pearson Education.
- Thomas Connolly Carolyn Begg: Database Systems, Pearson Education.
- Korth & Silberschatz: Database System Concept, McGraw Hill International Edition.
- Raghu Ramakrishnan & Johannes Gehrke: Database Management Systems, McGraw Hill.
- Ivan Bayross: SQL, PL/SQL- The Program Language of ORACLE, BPB Publication.

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | COMPUTER APPLICATIONS | | |
| Semester | II | | |
| Name of the Course | Programming Methodologies | | |
| Course Code | B23-CAC-203 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After learning this course students will be able:<br>1. To understand the concept of problem-solving using algorithms and flowcharts.<br>2. To understand the concept of program and debugging.<br>3. To learn the basic programming constructs.<br>4. To understand various programming methodologies.<br>5. To understand the various programming methodologies by implementing these practically. | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| Contact Hours | 1 | 2 | 3 |
| **Max. Marks:50(30(T)+20(P))**<br>**Internal Assessment Marks:15(10(T)+5(P))**<br>**End Term Exam Marks:35(20(T)+15(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B-Contents of the Course** | | | |
| **<u>Instructions for Paper-Setter</u>** | | | |

| **Unit** | **Topics** | **Contact Hours** |
|---|---|---|
| I | **Problem Solving**: Understanding the problem, Analyzing the problem, and Identifying the solution.<br>**Tools for Problem-Solving**: Flowcharts and its Symbols. Algorithm designing. Examples of Algorithms with flow chart. Decision Table. | 4 |

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|---|---|---|
| II | **Program**: Concept of a program, Need for writing programs, Characteristics of a good program, Programming style, Documentation, and Program Maintenance.<br>**Debugging Programs**: Syntax Errors, Run-Time Errors, Logical Errors.<br>Process of conceptualizing a solution to a problem and moving from algorithm to programming. | 4 |
| III | **General Concepts**: Clarity and Simplicity of Expressions, Use of proper names for Identifiers, Comments, Indentation; and Documentation.<br>**Programming Constructs**: Sequence, Selection, and Iteration; Simulation (dry run) of the program for better understanding of algorithm; Comparison and Analysis of Algorithms through simulations. | 4 |
| IV | **Methodologies**: Structured programming, Top-down approach, Bottom-up approach, Functional programming, Modular programming, and Object-oriented programming. | 3 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Draw a flowchart and design an algorithm that calculates simple interest using principle, rate, and time.<br>• Draw a flowchart and write an algorithm to swap the values of two variables.<br>• Draw a flowchart and design an algorithm to check whether the given number is even or odd.<br>• Draw a flowchart and design an algorithm that inputs three numbers and displays the largest number.<br>• Draw a flowchart and design an algorithm to find the smallest from n numbers.<br>• Draw a flowchart and design an algorithm to find the greatest from n numbers.<br>• Draw a flowchart and design an algorithm to find the sum and average of n input numbers.<br>• Draw a flowchart and design an algorithm to find the sum of the digits of the input number.<br>• Identify the requirements for a college system computerization.<br>• Identify the various modules in a banking system.<br>• Identify the complete design of a general grocery store.<br>• Draw the decision table for finding the greatest of three numbers.<br>• Draw to decision table for checking eligibility for admission to college in an undergraduate programme taking your own assumptions. | 30 |
| **Suggested Evaluation Methods** | | |

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: NA<br>• Mid-Term Exam: 6<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**A three-hour exam for both theory and practicum.**<br>**End Term Exam Marks:35(20(T)+15 (P))** |
| **Part C-Learning Resources** | |
| **Text /Reference Books:**<br>• Sinha, P.K. & Sinha, Priti, Computer Fundamentals, BPB.<br>• Dromey, R.G., How to Solve It by Computer, PHI.<br>• Norton, Peter, Introduction to Computer, McGraw-Hill.<br>• Leon, Alexis & Leon, Mathews, Introduction to Computers, Leon Tech World.<br>• Rajaraman, V., Fundamentals of Computers, PHI. | |

***Applicable for courses having practical components.**

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | COMPUTER APPLICATIONS | | |
| Semester | II | | |
| Name of the Course | Web Technologies Fundamentals | | |
| Course Code | B23-CAC-204 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | MDC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn the basics of web development.<br>2. understand different types of web pages and websites.<br>3. implement HTML and CSS for web page designing.<br>4. Understand the design of web crawlers and search engines.<br>5*. implement the programs based on variousweb development concepts. | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |
| **Max. Marks:75(50(T)+25(P))**<br>**Internal Assessment Marks:20(15(T)+5(P))**<br>**End Term Exam Marks: 55(35(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**<u>Instructions for Paper-Setter</u>**

The examiner will set a total of nine questions. Out of which, the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate will have to attempt five questions, selecting one from each unit. The first question will be compulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

| **Unit** | **Topics** | **Contact** |
|---|---|---|

| | | Hours |
|---|---|---|
| I | Introduction to Internet and World Wide Web (WWW); Evolution and History of World Wide Web, Web Pages and Contents, Web Clients, Web Servers, Web Browsers; Hypertext Transfer Protocol, URLs; Searching, Search Engines and Search Tools. | 7 |
| II | Web Publishing: Hosting website; Internet Service Provider; Planning and designing website; Web Graphics Design, steps for Developing website<br>Creating a Website and Introduction to Markup Languages (HTML and DHTML), | 7 |
| III | HTML Document Features & Fundamentals, HTML Elements, Creating Links; Headers; Text styles; Text Structuring; Text colour and Background; Formatting text; Page layouts, Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes, HTML5 | 8 |
| IV | Introduction to CSS (Cascading Style Sheets): Features, Core Syntax, Types, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Positioning, and other useful Style Properties; Features of CSS3. Introduction to Client–Side Programming | 8 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Create a web page using an ordered list and an unordered list.<br>• Design a web page to show your institute with hyperlinks.<br>• Design a blog-style personal website.<br>• Create your resume on an HTML page.<br>• Create a web page and divide the web page into four frames. In one frame create three links that will display different HTML forms in the remaining three frames respectively.<br>• Create a web page to show the record of the college in the form of a table.<br>• Write an HTML code to add internal CSS on a webpage<br>• Design a web page to display your college with hyperlinks.<br>• Write a JavaScript function to calculate the sum of two numbers.<br>• Write a CSS file and attach it to any 3 HTML web pages.<br>• Use Div and span in a page and color two words with the same colors.<br>• Using HTML, and CSS create a styled checkbox with animation on state change. | 30 |
| **Suggested Evaluation Methods** | | |

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.:4<br>• Mid-Term Exam: 7<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:5<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for both theory and practicum.<br>**End Term Exam Marks: 55(35(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.
- Ramesh Bangia, Multimedia and Web Technology, Firewall Media.
- Thomas A. Powell, Web Design: The Complete Reference, Tata McGraw-Hill
- Wendy Willard, HTML Beginners Guide, Tata McGraw-Hill.
- Deitel and Goldberg, Internet and World Wide Web, How to Program, PHI
- David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.
- Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd.

*Applicable for courses having practical components.

# Kurukshetra University, Kurukshetra
**(Established by the State Legislature Act XII of 1956)**
**('A+' Grade, NAAC Accredited)**

|| योगस्थ: कुरु कर्माणि ||
समबुद्धि व योग युक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)

Syllabus of Examination (2nd Semester) for Under-Graduate Programmes
**Bachelor of Vocation (Software Development)**
**B.Voc. (Software Development)**
according to
Curriculum Framework for Under-Graduate Programmes
As per NEP-2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)

## DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

(For the Batches Admitted From 2023-2024)

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | B.Voc. (Software Development) | | |
| Semester | II | | |
| Name of the Course | Object Oriented Programming using C++ | | |
| Course Code | B23-CSD-201 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | B23-CSD-101 | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn the input/output statements and functions in C++.<br>2. get familiar with OOPS concepts, constructors, and destructors in C++.<br>3. Learn the various concepts of operator overloading and inheritance.<br>4. get familiar with concepts of virtual functions and exception handling in C++ language.<br>5*. implement the programs based on various concepts of C++. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**<u>Instructions for Paper-Setter</u>**

The examiner will set a total of nine questions. Out of which, the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate will have to attempt five questions, selecting one from each unit. First

question will be compulsory.
The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Input Output in C++**: Unformatted and Formatted I/O Operations. I/O using insertion and extraction operators and streams in C++.<br>**Functions**: Declaration and Definition, return values, arguments, passing parameters by value, call by reference, call by pointer, Recursion, Inline Functions, Function overloading.<br>Pointers, structures, and union in C++. | 11 |
| II | **Object-oriented features of C++**: Class and Objects, Data hiding and encapsulation, abstraction, Data Members and Member Functions, accessing class members, empty class, local class, global class, Scope Resolution Operator and its Uses, Static Data Members, Static Member Functions, Structure vs Class, Friend function and friend class.<br>**Constructors and Destructors**: Constructors, Instantiation of objects, Default constructor, Parameterized constructor, Copy constructor and its use, Destructors, Dynamic initialization of objects. | 12 |
| III | **Operator Overloading:** Overloading unary and binary operators: arithmetic operators, manipulation of strings using operators.<br>**Inheritance**: Derived class, base class, Accessing the base class member, Inheritance: multilevel, multiple, hierarchical, hybrid; Virtual base class, Abstract class. | 11 |
| IV | Virtual Functions, pure virtual functions; Polymorphism and its types<br>**Exception Handling in C++**: exception handling model, exception handling constructs - try, throw, catch, Order of catch blocks, Catching all exceptions, Nested try blocks, handling uncaught exceptions. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Write a C++ program to print the following lines:<br>  • Your introduction<br>  • Your institute introduction<br>• Write a program that accepts principle, rate, and time from the user and prints the simple interest.<br>• Write a program to swap the values of two variables.<br>• Write a program to check whether the given number is even or odd (using ?: ternary operator).<br>• Write a program to check whether the given number is positive or negative (using?: ternary operator).<br>• Write a program that inputs three numbers and displays the largest number using the ternary operator.<br>• WAP to initialize data members of the class using the constructor.<br>• Pass values to the constructor and initialize the members of that class to those values.<br>• Create a class called cube with the data members | 30 |

| | | |
|---|---|---|
| | Length, Breadth, Height<br>• Members functions:<br>  • To accept the details.<br>  • To calculate the volume of the cube.<br>  • To display the details.<br>• WAP to calculate the sum using constructor overloading.<br>• WAP to demonstrate the use of destructor.<br>• Create a C++ Program to show the order of constructor and destructor.<br>• C++ Program to Find the Number of Vowels, Consonants, Digits, and White Spaces in a String<br>• C++ Program to Multiply Two Matrices by Passing Matrix to Function<br>• Increment ++ and Decrement -- Operator Overloading in C++ Programming<br>• C++ Program to Add Two Complex Numbers<br>• C++ Program to Show Function Overriding<br>• C++ Program to Show Polymorphism in Class<br>• C++ Program to Show Function Overloading<br>• C++ Program to Show Inheritance | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for boththeory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

- Herbert Scildt, C++, The Complete Reference, Tata McGraw-Hill
- Robert Lafore, Object Oriented Programming in C++, SAMS Publishing
- Bjarne Stroustrup, The C++ Programming Language, Pearson Education
- Balaguruswami, E., Object Oriented Programming in C++, Tata McGraw-Hill.
- Richard Johnson, An Introduction to Object-Oriented Application Development, Thomson Learning.

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | B.Voc. (Software Development) | | |
| Semester | II | | |
| Name of the Course | Introduction to Web Technologies | | |
| Course Code | B23-CSD-202 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. learn the basics of web development.<br>2. understand different types of web pages and websites.<br>3. implement HTML and CSS for web page designing.<br>4. Understand the design of web crawlers and search engines.<br>5*. implement the programs based on various concepts of web development. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |

**<u>Instructions for Paper- Setter</u>**

Examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. Examination will be of three-hour duration. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus.

Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.

Practicum will be evaluated by an external and an internal examiner. Examination will be of

| three-hour duration. | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | Introduction to Internet and World Wide Web (WWW); Evolution and History of World Wide Web, Web Pages and Contents, Web Clients, Web Servers, Web Browsers; Hypertext Transfer Protocol, URLs; Searching, Search Engines, and Search Tools.<br>Web Publishing: Hosting website; Internet Service Provider; Planning and designing website; Web Graphics Design, Steps For Developing website | 11 |
| II | Creating a Website and Introduction to Markup Languages (HTML and DHTML), HTML Document Features and fundamentals, HTML Elements, Creating Links; Headers; Text styles; Text Structuring; Text color and Background; Formatting text; Page layouts, Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes, HTML5 | 11 |
| III | Introduction to CSS (Cascading Style Sheets): Features, Core Syntax, Types, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Positioning, and other useful Style Properties; Features of CSS3. | 12 |
| IV | The Nature of JavaScript: Evolution of Scripting Languages, JavaScript-Definition, Programming for Non-Programmers, Introduction to Client–Side Programming, Enhancing HTML Documents with JavaScript. Static and Dynamic web pages | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limitedto but including the following types of problems:<br>• Create a web page using ordered list and unordered list.<br>• Design a web page to show your institute with hyperlinks.<br>• Create your resume on HTML page.<br>• Create a web page divide the web page into four frames. In one frame create three links that will display different HTML forms in the remaining three frames respectively.<br>• Create a web page to show the record of the college in the form of a table.<br>• Write an HTML code to add internal CSS on a webpage<br>• Design a blog-style personal website.<br>• Design a web page to display your college with hyperlinks.<br>• Write a JavaScript function to calculate the sum of two numbers.<br>• Write a JavaScript program to find the maximum number in an array.<br>• Write a JavaScript function to check if the given string is a palindrome (reads the same forwards and backward).<br>• Write a CSS file and attach it to any 3 HTML web pages.<br>• Use Div and span in a page and color two words with the same colors.<br>• Using HTML, CSS create a styled checkbox with animation on state change | 30 |

| | | |
|---|---|---|
| | • Design a web page that is like a compose page of e-mail. It should have:<br>a) Text boxes for To, CC, and BCC respectively.<br>b) Text field for the message.<br>c) Send button.<br>d) Option for selecting a file for attachment<br>• After clicking the send button a new page should open with the display message "Message has been sent". | |

| **Suggested Evaluation Methods** | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for boththeory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

| **Part C-Learning Resources** |
|---|
| **Recommended Books/e-resources/LMS:**<br>• Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.<br>• Ramesh Bangia, Multimedia and Web Technology, Firewall Media.<br>• Thomas A. Powell, Web Design: The Complete Reference, Tata McGraw-Hill<br>• Wendy Willard, HTML Beginners Guide, Tata McGraw-Hill.<br>• Deitel and Goldberg, Internet and World Wide Web, How to Program, PHI<br>• David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.<br>• Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd. |

*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | B.Voc. (Software Development) | | |
| Semester | II | | |
| Name of the Course | Concepts of Operating Systems | | |
| Course Code | B23-CSD-203 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. understand the basic concepts of operating systems and their services along with process management.<br>2. understand the concept of process scheduling and acquire knowledge of process synchronization.<br>3. learn about memory management and virtual memory concepts.<br>4. learn to work with directory structure and security aspects.<br>5*. Implement the programs based on the operating system. | | |
| Credits | Theory | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 3 | 2 | 5 |
| **Max. Marks:100(70(T)+30(P))**<br>**Internal Assessment Marks:30(20(T)+10(P))**<br>**End Term Exam Marks: 70(50(T)+20(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B- Contents of the Course** | | | |
| **Instructions for Paper-Setter**<br>The examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. First question | | | |

| | | |
|---|---|---|
| will comprise short answer-type questions covering the entire syllabus.<br>The candidate must attempt five questions in all, selecting one question from each unit. First question will be compulsory.<br>The practicum will be evaluated by an external and an internal examiner. The examination will be ofthree-hour duration. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | Introductory Concepts: Operating System, Functions and Characteristics, Historical Evolution of Operating Systems, Operating System Structure.<br>Types of Operating System: Real-time, Multiprogramming, Multiprocessing, Batch processing.<br>Operating System Services, Operating System Interface, Service System Calls, and System Programs.<br>Process Management: Process Concepts, Operations on Processes, Process States, and Process Control Block. Inter-Process Communication. | 11 |
| II | CPU Scheduling: Scheduling Criteria, Levels of Scheduling, Scheduling Algorithms, Multiple Processor Scheduling, Algorithm Evaluation.<br>Synchronization: Critical Section Problem, Semaphores, Classical Problem of Synchronization, Monitors.<br>Deadlocks: Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery. | 12 |
| III | Memory Management Strategies: Memory Management of Single-user and Multiuser Operating Systems, Partitioning, Swapping, Contiguous Memory Allocation, Paging and Segmentation;<br>Virtual Memory Management: Demand Paging, Page Replacement Algorithms, Thrashing. | 11 |
| IV | Implementing File System: File System Structure, File System Implantation, File Operations, Type of Files, Directory Implementation, Allocation Methods, and Free Space Management.<br>Disk Scheduling algorithm - SSTF, Scan, C- Scan, Look, C-Look.<br>SSD Management. | 11 |
| V* | Practicum:<br>Students are advised to do laboratory/practical practice not limited to but including the following types of problems:<br>• Working with various operating systems, and performing different operations using operating systems.<br>• Write a program to print file details including owner access permissions, and file access time, where file name is given as argument.<br>• Write a program to copy files using system calls. | 30 |

| | | |
|---|---|---|
| | • Write a program to implement the FCFS scheduling algorithm.<br>• Write a program to implement the Round Robin scheduling algorithm.<br>• Write a program to implement the SJF scheduling algorithm.<br>• Write a program to implement a non-preemptive priority-based scheduling algorithm<br>• Write a program to implement preemptive priority-based<br>• scheduling algorithm.<br>• Write a program to implement the SRJF scheduling algorithm.<br>• Write a program to calculate the sum of n numbers using the thread library.<br>• Write a program to implement first-fit, best-fit, and worst-fit allocation strategies. | |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 5<br>• Mid-Term Exam: 10<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: NA | **End-Term Examination:** A three-hour exam for both theory and practicum.<br>**End Term Exam Marks: 70(50(T)+20(P))** |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**


- Silberschatz A., Galvin P.B.,and Gagne G., Operating System Concepts, John Wiley & Sons.
- Godbole, A.S., Operating Systems, Tata McGraw-Hill Publishing Company, New Delhi.
- Deitel, H.M., Operating Systems, Addison- Wesley Publishing Company, New York.
- Tanenbaum, A.S., Operating System- Design and Implementation, Prentice Hall of India, New Delhi.


*Applicable for courses having practical components.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**
**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | B.Voc. (Software Development) | | |
| Semester | II | | |
| Name of the Course | Mathematical Foundations for Computer Science-II | | |
| Course Code | B23-CSD-204 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes (CLO): | After learning this course students will be able:<br>1. Understand the concept of integration.<br>2. Acquire cognitive and technical knowledge about a variety of methods of representation of statistical data<br>3. Understand methods of measure of central tendency. Analyze the problem and apply the best measure of central tendency to draw inferences from the available data.<br>4. Understand the concept of correlation, and correlation methods and conclude about the type of correlation for the available data. Comprehend the skills of curve fitting.<br>5. * Attain a range of cognitive and technical skills to integrate various functions. Have the technical and practical skills required for selecting and using suitable methods for data representation and measurement of central tendency. | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| Contact Hours | 1 | 2 | 3 |
| **Max. Marks:50(30(T)+20(P))**<br>**Internal Assessment Marks:15(10(T)+5(P))**<br>**End Term Exam Marks:35(20(T)+15(P))** | | **Time: 3 Hrs.(T), 3Hrs.(P)** | |
| **Part B-Contents of the Course** | | | |

**Instructions for Paper-Setter**

The examiner will set a total of nine questions. Out of which the first question will be compulsory. The remaining eight questions will be set from four units selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus. The candidate must attempt five questions in all, selecting one question from each unit. The first question will be compulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | Integration of simple algebraic, trigonometric, and exponential functions.<br>**Presentation of data**: Frequency distribution and cumulative frequency distribution, Diagrammatic and graphical presentation of data, Construction of bar, Pie diagrams, Histograms, Frequency polygon, Frequency curve, and Ogives. | 4 |
| II | **Measures of central tendency**: Arithmetic mean, Median, Mode, Geometric mean, and Harmonic mean for ungrouped and grouped data.<br>**Measures of dispersion**: Concept of dispersion, Mean deviation and its coefficient, Range, Variance and its coefficient, Standard deviation. | 4 |
| III | **Correlation**: Concept and types of correlation, Methods of finding correlation: Scatter diagram, Karl Pearson's coefficients of correlation, Rank correlation. | 3 |
| IV | **Linear regression**: Principle of least square, Fitting of a straight line, Two lines of regression, Regression coefficients. | 4 |
| V* | **Practicum**: Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:<br>**Problem Solving**- Questions related to the practical problems based on the following topics will be worked out and a record of those will be maintained in the Practical Note Book:<br>• Demonstrate skills in finding integration of simple functions.<br>• Representation of data using Bar and pie diagrams.<br>• Representation of data using Histogram, Frequency polygon, Frequency curves, and Ogives.<br>• Problems to compute measures of central tendency.<br>• Problems to calculate measures of dispersion.<br>• Problem to calculate Karl Pearson's coefficient of correlation.<br>• Problem to fit the straight line for the given data.<br>• Problem to find lines of regression. | 30 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: NA<br>• Mid-Term Exam: 6<br>➢ **Practicum**<br>• Class Participation: NA<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: NA | **End Term Examination:**<br>**A three-hour exam for both theory and practicum.**<br>**End Term Exam Marks:35(20(T)+15(P))** |

**Part C-Learning Resources**

**Text /Reference Books:**


- S.C. Gupta and V.K. Kapoor (2014). Fundamentals of Mathematical Statistics, S. Chand & Sons, Delhi.
- R.V. Hogg, J. W. McKean and A. T. Craig (2013). Introduction to Mathematical Statistics (7 th edition), Pearson Education.
- J. V. Dyke, J. Rogers and H. Adams (2011). Fundamentals of Mathematics, Cengage Learning.
- A.S. Tussy, R. D. Gustafson and D. Koenig (2010). Basic Mathematics for College Students. Brooks Cole.
- G. Klambauer (1986). Aspects of calculus. Springer-Verlag.


*Applicable for courses having practical components.

**It is School Based Activity

| Year - 2 | | | | | |
|---|---|---|---|---|---|
| | | Maximum Marks | | | |
| Paper | Nomenclature | Total | External | Internal/Practicum | Exam Hour |
| Course-5 | Gender School and Society | 50 | 35 | 15 | 1:30 hrs |
| **Course-7 * Any one of the following** | Pedagogy of School Subjects-II | 100 | 70 | 30 | 3 hrs |
| Course-8 | Knowledge and Curriculum | 100 | 70 | 30 | 3 hrs |
| Course-9 | Assessment for Learning | 100 | 70 | 30 | 3 hrs |
| Course-10 | Creating an Inclusive School | 50 | 35 | 15 | 1:30 hrs |
| Course-11****Optional Course** | | | | | |
| i | Environment Education | 50 | 35 | 15 | 1:30 hrs |
| ii | Peace Education | 50 | 35 | 15 | 1:30 hrs |
| iii | Health, Physical & Yoga Education | 50 | 35 | 15 | 1:30 hrs |
| iv | Guidance and Counseling | 50 | 35 | 15 | 1:30 hrs |
| Course-12*** EPC-2 | Drama and Art in Education | 50 | 25 | 25 | 1:30 hrs |
| Course-12*** EPC-4 | Understanding the Self | 50 | 25 | 25 | 1:30 hrs |
| Course-13 (B) | School Teaching, Practice Pedagogy – II for 45 days | 175 | 100 | 75 | 1:30 hrs |
| | Total | 725 | 465 | 260 | |

1. Pedagogy of English.
2. Pedagogy of Hindi.
3. Pedagogy of Mathematics – **(Pedagogy of Mathematics is not for the students who have opted the same in the 1st year)**

** The Directorate would supply the Study Material only for Paper: Health, Physical and Yoga Education. In case, any student selects other options from the above optional papers, he/she would have to prepare the concerned paper at his/her won level and no study material would be provided for the same by the Directorate and the PCP would also not be conducted

*** It is School Basesd Activity.

**COURSE 11 (Optional)**

**(iii) HEALTH, PHYSICAL & YOGA EDUCATION**

**Time: 1.30 Hours** **Max. Marks: 50**

**(External: 35, Internal : 15)**

**NOTE FOR PAPER SETTER**

**i. Paper setter will set five questions in all, out of which students will be required to attempt three questions.**

**ii. Q. No 1 will be compulsory and will carry 7 marks. There will be two short-answer type Questions of 4 and 3 marks each to be selected from the entire syllabus.**

**iii. Two long answer type questions will be set from each of the two units, out of which the student will be required to attempt one question from each unit.**
**Long-answer type questions will carry 14 marks each.**

**Learning Outcomes:-**

After the transaction of the course, student teachers will be able to:

- explain the concept of Health, Physical & Yoga Education along with their roles for a healthy Individual.
- understand the basis of Diet and Nutrition.
- acquaint themselves with ways and means to protect pollution and Global Warming.
- understand correct posture.
- understand and apply various ways and means for the safety and security of the child.

**Course Contents**

**Unit-I**

1. **Health, Yoga & Physical Education:**
   - Concept of Health and factors affecting Health.
   - Concept and types of Yoga.
   - Physical Education and its objectives.
   - Role of School and society in developing a healthy individual through the programmes of Health, Yoga and Physical Education.
2. **Food and Nutrition:**
   - Diet, Food and nutrition
   - Balanced diet, its functions and components.
   - Types of food according to Yogis and Yogic Diet.
   - Malnutrition- causes and prevention

**Unit-II**

3. **Safety and Security**
   - Communicable diseases- modes, Prevention and control.
   - Role of Religion in propogation of Peace. Mother-Teresa, Vivekananda, Gandhian Philosophy in promoting Peace Education. Role of Great personalities in promoting Peace.
   - Challenges to Peace- Stress, Conflict, Crimes, Terrorism, Violence and Modernization.
   - Strategies and Methods of teaching Peace Education- Meditation, Yoga, Dramatization, Debate and etc.

- Democracy and Peace, Secularism and Peace, Culture and Peace.

**Practicum/Sessionals**

**Any one of the following:**

**i.** Prepare a Role Play of Great Personalities who worked/contributed towards Peace.
**ii.** Organize an activity in schools to promote Peace.
**iii.** Write a report on Gandhi and Peace.
**iv.** Write about the contribution of any two Noble Prize winners for Peace.
**v.** Prepare an album of Indian Philosophers and write their thoughts on peace.

**Note: Practicum/Sessionals are Assignments for Internal Assessment.**

**References**

Adams. D(Ed)(1997). UNESCO and a culture of Peace: Promoting a GlobalMovement.

Paris UNESCO.

Taj.H. (2005).National Concerns and Education, Neelkamal Publications. Pvt. Ltd

Taj.H. (2005). Current Challenges in Education, Neelkamal Publications. Pvt. Ltd

Bhargave.M. &Taj.H(2006). Glimpesof Higher Education. Agra-2: RakhiPrakashan,

http://www.un.org/cyberschoolbus/peace/content.html.

**COURSE 11 (Optional)**
**(ii) PEACE EDUCATION**

**Time: 1.30 Hours** **Max. Marks: 50**

**(External: 35, Internal : 15)**

**NOTE FOR PAPER SETTER**

**i. Paper setter will set five questions in all, out of which students will be required to attempt three questions.**

**ii. Q. No 1 will be compulsory and will carry 7 marks. There will be two short-answer type Questions of 4 and 3 marks each to be selected from the entire syllabus.**

**iii. Two long answer type questions will be set from each of the two units, out of which the student will be required to attempt one question from each unit.**
**Long-answer type questions will carry 14 marks each.**

**Learning Outcomes:-**

After the transaction of the course, student teachers will be able to:

- understand the concept of peace education.
- acquire the knowledge about peaceful mind makes peaceful world.
- understand the philosophical thoughts for peace.
- understand the nature of conflicts and their resolution.
- develop the ability to use various methods and techniques for teaching peace education.
- adopt peace education in the curriculum.
- imbibe the knowledge, attitude and skills needed to achieve and sustain a global culture of peace.
- understand the dynamics of transformation of violence into peace.

**Course Contents**

**Unit-I**

1. **Introduction of Peace Education**
    - Meaning, Concept and need of Peace Education.
    - As a universal value.
    - Aims and Objectives of Peace Education.
    - Role of Social Agencies: Family, Religion, Mass Media, Community, School, NGO's, Government Agencies in promoting peace education.
    - Current status of Peace Education at Global Scenario.

**Unit-II**

2. **Peace In The Indian context**

# KURUKSHETRA UNIVERSITY
# KURUKSHETRA

## Scheme of Examination and Syllabus for

## Master of Performing Arts (M.P.A.)

## (5-Year Integrated)

## Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020w.e.f. 2023-24 (In phased manner)

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**Scheme of Examination for Integrated Programme under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020 w.e.f. 2023-24 (In phased manner),**

**Master of Performing Arts (M.P.A.) (5-Year Integrated) under Scheme D**

| (First Year: Semester-1) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Semester** | **Course** | **Paper(s)** | **Nomenclature of Paper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **SEM-1** | **CC-A1 4 credit** | B23-PAS-101 | Concepts of Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-B1 4 credit** | B23-PAS-102 | Basic Introduction of String Instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-C1 4 credit** | B23-PAS-103 | Fundamentals of Percussion instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-M1 2 credit** | *From All Available CC-M1 of two credits as per NEP | | | | | | | |
| | **MDC-1 3 credits** | From All Available MDC-1 of three credits as per NEP | | | | | | | |
| | **AEC-1 2 credit** | From All Available AEC-1 of two credits as per NEP | | | | | | | |
| | **SEC-1 3 credit** | From All Available SEC-1 of two credits as per NEP | | | | | | | |
| | **VAC-1 2 credit** | From All Available VAC-1 of two credits as per NEP | | | | | | | |

*Minor subject from Art discipline other than Music available in the discipline

| (First Year: Semester-2) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Semester** | **Course** | **Paper(s)** | **Nomenclature of Paper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **SEM-2** | **CC-A2 4 credit** | B23-PAS-201 | Concept of Raga in Indian Classical Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-B2 4 credit** | B23-PAS-202 | Technical Aspects of Sitar | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-C2 4 credit** | B23-PAS-203 | Basic Introduction of Tabla & Musicology | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-M2 2 credit** | *From All Available CC-M2 of two credits as per NEP | | | | | | | |
| | **MDC-2 3 credits** | From All Available MDC-2 of three credits as per NEP | | | | | | | |
| | **AEC-2 2 credit** | From All Available AEC-2 of two credits as per NEP | | | | | | | |
| | **SEC-2 3 credit** | From All Available SEC-2 of two credits as per NEP | | | | | | | |
| | **VAC-2 2 credit** | From All Available VAC-2 of two credits as per NEP | | | | | | | |
| **Internship of 4 credits after 2nd Semester** | | | | | | | | | |

*Minor subject from Art discipline other than Music available in the discipline

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**Scheme of Examination for Integrated Programme under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020 w.e.f. 2023-24 (In phased manner),**

**Master of Performing Arts (M.P.A.) (5-Year Integrated) under Scheme D**

| (Second Year: Semester-3) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Semester** | **Course** | **Paper(s)** | **Nomenclature of Paper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **SEM-3** | **CC-A3 4 credit** | B23-PAS-301 | Principles of North Indian Classical Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-B3 4 credit** | B23-PAS-302 | History of Sitar and other Instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-C3 4 credit** | B23-PAS-303 | Introduction of Indian Dance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-M3 4 credit** | *From All Available CC-M3 of four credits as per NEP | | | | | | | |
| | **MDC-3 3 credits** | From All Available MDC-3 of three creditsas per NEP | | | | | | | |
| | **AEC-3 2 credit** | From All Available AEC-3 of two credits as per NEP | | | | | | | |
| | **SEC-3 3 credit** | From All Available SEC-3 of two credits as per NEP | | | | | | | |
| **Internship of 4 credits after 2nd Semester** | | | | | | | | | |

*Minor subject from Art discipline other than Music available in the discipline

| (Second Year: Semester-4) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Semester** | **Course** | **Paper(s)** | **Nomenclature of Paper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **SEM-4** | **CC-A4 4 credit** | B23-PAS-401 | History of Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-B4 4 credit** | B23-PAS-402 | Technical aspects of Sitar Education | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-C4 4 credit** | B23-PAS-403 | Therapeutic Aspects of Indian Classical Dance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-M4* (V) 4 credit Select one option** | B23-PAS-404 | Various Forms of Hindustani Classical Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-PAS-405 | Musical Instruments : History and Structure | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-PAS-406 | Teaching System of Tabla and its development | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-PAS-407 | General Introduction of Indian Classical Dance & Folk Dance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **AEC-4 2 credit** | From All Available AEC-4 of two credits as per NEP | | | | | | | |
| | **VAC-3 2 credit** | From All Available VAC-3 of two credits as per NEP | | | | | | | |
| **Internship of 4 credits after 4th Semester (if not done after second semester)** | | | | | | | | | |

* A Student will opt one specialization out of the four areas (i)Vocal (ii) sitar (iii) Tabla (iv) Kathak for CC-M4 (V) will carry that specialization forward upto 10th semester .

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**Scheme of Examination for Integrated Programme under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020 w.e.f. 2023-24 (In phased manner),**

**Master of Performing Arts (M.P.A.) (5-Year Integrated) under Scheme D**

| (Third Year: Semester-5) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Semester** | **Course** | **Paper(s)** | **Nomenclature of Paper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **SEM-5** | **CC-A5 4 credit** | B23-PAS-501 | Inter-relation of Music with Various Subjects | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-B5 4 credit** | B23-PAS-502 | Basic terms and aesthetical components of Tabla | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-C5 4 credit** | B23-PAS-503 | Aesthetics of Kathak Dance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-M5 (V) 4 credit** | B23-PAS-504 | Various Vocal Forms of North Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-PAS-505 | Development of Indian Musical Instruments from Vedic period to 1st Centaury | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-PAS-506 | History and development of Taal System from ancient to modern era. | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-PAS-507 | Components & Techniques of Stage Performance In Kathak Dance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **Internship 4 credits** | **Internship#4 credit after 4th semester** | | | | | | | |

| (Third Year: Semester-6) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Semester** | **Course** | **Paper(s)** | **Nomenclature of Paper** | **Credits** | **Hours/ Week** | **B23ternal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **SEM-6** | **CC-A6 4 credit** | B23-PAS-601 | Music Education System | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-B6 4 credit** | B23-PAS-602 | Classification of instruments and their description | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-C6 4 credit** | B23-PAS-603 | Comparative Study of Kathak with other Dance Forms | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | **CC-M6 4 credit** | *From All Available CC-M6 of 4 credits as per NEP | | | | | | | |
| | **CC-M7 (V) 4 credit** | B23-PAS-604 | Principles of Khyal Style of Hindustani Classical Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-PAS-605 | Musical Instruments from 1st Century to Modern period | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-PAS-606 | Compositional forms of Avnadhya –Vadya | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-PAS-607 | Importance of Instrument in Kathak Dance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

*Minor subject from Art discipline other than Music available in the discipline

| (Fourth year: Semester-7) (FOR HONOURS/HONOURS WITH RESEARCH) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Course** | **Paper(s)** | **Nomenclature ofPaper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **CC-H1 4 Credits** | B23-PAS-701 | Theoretical survey of Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-711 | Origin and Development of Strings instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Select one option** | B23-PAS-721 | History of Indian Percussion Instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-731 | Ancient History of Kathak Dance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **CC-H2 4 Credits** | B23-PAS-702 | Principles and Techniques of Stage Performance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-712 | String instruments in Ancient period | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Select one option** | B23-PAS-722 | Concept of different Tabla Gharana | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-732 | Aesthetic Principles of Dance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-703 | Applied theory of Performing Arts | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **CC-H3 4 credit** | B23-PAS-713 | Non percussion instruments and Indian music in medieval period | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Select one option** | B23-PAS-723 | Analytical study of South Indian Taal system. | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-733 | Study of Folk Dances of India and treatise | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **DSE-H1 4 credit Select one Option** | B23-PAS-704 | Basic training of Stage and Sound Arrangement and Music Appreciation | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-714 | Comparative study between North Indian and South Indian music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-724 | Technical and Mathematical studies of Tabla compositions | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-734 | General introduction to the classical Dances of India | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **PC-H1 4 credit Select one Option** | B23-PAS-705 | Vocal Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-715 | Sitar Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-725 | Tabla Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-735 | Kathak Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| **CC-HM1 4 credit** | From the available courses as per NEP Ordinance | | | | | | | |

*The Course Codes according to different specializations are given below .

Sem VII - Vocal -701 to705 ,Sitar- 711-715 ,Tabla – 721-725 ,Kathak -731-735

| (Fourth Year: Semester-8) (FOR HONOURS) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Course** | **Paper(s)** | **Nomenclature of Paper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **CC-H4 4 credit Select one option** | B23-PAS-801 | Historical Development of Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-811 | Indian Musical education in pre Muslim Era | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-821 | Conventional music and Instruments of India | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-831 | History and Development of Kathak Dance in Literature | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **CC-H5 4 credit Select one option** | B23-PAS-802 | Principles and techniques of Stage Performance & Recording Studio Works | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-812 | Historical development of Voice recording | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-822 | Study of musical acoustics and its implications in music. | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-832 | Aesthetic of Dance in Literature | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **CC-H6 4 credit Select one option** | B23-PAS-803 | Aesthetical Study of Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-813 | Different schools of Indian musical instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-823 | Various non-percussion instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-833 | Principles and Techniques of Stage Performance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **DSE-H2 4 credit** | B23-PAS-804 | Digital Era Recording Techniques and Application of Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Select one Option** | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-814 | Sitar in different forms of classical, semi classical and light music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-824 | Functioning of music production | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-834 | General Introduction of Vocal in Kathak Dance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **PC-H2 4 credit Select one Option** | B23-PAS-805 | Vocal Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-815 | Sitar Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-825 | Tabla Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-835 | Kathak Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| **CC-HM2 4 credit** | From the available courses as per NEP Ordinance | | | | | | | |

*The Course Codes according to different specializations are given below

Sem VIII - Vocal -801 to 805 ,Sitar- 811-815 ,Tabla – 821-825 ,Kathak -831-835

| OR SEMESTER-8 (FOR HONOURS WITH RESEARCH) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Course** | **Paper(s)** | **Nomenclature ofPaper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **CC-H4 4 credit Select one option** | B23-PAS-801 | Historical Development of Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-811 | Indian Musical education in pre Muslim Era | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-821 | Conventional music and Instruments of India | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-831 | History and Development of Kathak Dance in Literature | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **CC-H5 4 credit Select one option** | B23-PAS-802 | Principles and techniques of Stage Performance & Recording Studio Works | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-812 | Historical development of Voice recording | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-822 | Study of musical acoustics and its implications in music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-832 | Aesthetic of Dance in Literature | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Project/ Dissertation 12 credit** | B23-PAS-806 | **Project/Dissertation** | 8+4 | - | - | - | - | - |
| **Project/ Dissertatio n12 credit** | B23-PAS-816 | **Project/Dissertation** | 8+4 | - | - | - | - | - |
| **Project / Dissertation 12 credit** | B23-PAS-826 | **Project/Dissertation** | 8+4 | - | - | - | - | - |
| **Project/ Dissertation 12 credit** | B23-PAS-836 | **Project/Dissertation** | 8+4 | - | - | - | - | - |
| **CC-HM2 4 credit** | From the available courses as per NEP Ordinance | | | | | | | |

*The Course Codes according to different specializations are given below

Sem IX - Vocal -801 to 806 ,Sitar- 811-816 ,Tabla – 821-826 ,Kathak -831-836

| (Fifth Year: Semester-9) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Course** | **Paper(s)** | **Nomenclature ofPaper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **CC-PG1**<br><br>**4 credit**<br>**Select one option** | B23-PAS-901 | Interdisciplinary Approach in Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-911 | Structure and school of Indian string instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-921 | Musicology and essay compositions. | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-931 | History and Development of Dance in Purans | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **CC-PG2**<br><br>**4 credit**<br>**Select one option** | B23-PAS-902 | Aesthetics of Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-912 | Notation system and Gatas of Sitar | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-922 | Aesthetical components of rhythm. | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-932 | Aesthetic of Dance in Purans | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **CC-PG3**<br><br>**4 credit Select one option** | B23-PAS-903 | Voice Modulation Voice Culture & Application of Sound in Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-913 | Schools of non-percussion instruments and their player | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-923 | Principals of accompaniment | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-933 | Therapeutic Aspects of Classical Dance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **DSE-PG1 4 Credits**<br><br>**Select one Option** | B23-PAS-904 | Multidimensional Aspects of Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-914 | Fundamentals of recording studio and sitar recording | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-924 | Multidisciplinary Aspects of Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-934 | Study of Compositional Patterns of Kathak | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **PC-PG1 4 credit Select one Option** | B23-PAS-905 | Vocal Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-915 | Sitar Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-925 | Tabla Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-935 | Kathak Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| **CC-PGM1 4 credit** | From the available courses as per NEP Ordinance | | | | | | | |

*The Course Codes according to different specializations are given below

Sem IX - Vocal -901 to905 ,Sitar- 911-915 ,Tabla – 921-925 ,Kathak -931-935

| (Fifth Year: Semester-10) for those who have done Dissertation at 8th semester | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Course** | **Paper(s)** | **Nomenclature ofPaper** | **Credits** | **Hours/ Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **CC-PG4 4 credit** | B23-PAS-1001 | Research Methodology | 3+1 | 4 | 30 | 70 | 100 | 3 hrs. |
| **CC-PG5 4 credit Select one option** | B23-PAS-1002 | Interdisciplinary Aspects of Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-1012 | New concepts in musical instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-1022 | Ancient and Medieval History ofHindustani Percussion Instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-1032 | Study of Folk Dances Of Different Zone of India | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **CC-PG6 4 credit Select one option** | B23-PAS-803 | Aesthetical Study of Indian Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-813 | Different schools of Indian musical instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-823 | Various non-percussion instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-833 | Principal and Techniques of Stage Performance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **DSE-PG2 4 credit** | B23-PAS-804 | Digital Era Recording Techniques and Application of Music | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Select** | B23-PAS-814 | Sitar in different forms of classical, semi | 2 | 2 | 15 | 35 | 50 | 3 hrs. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **one Option** | | classical and light music | | | | | | |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-824 | Functioning of music production | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-834 | General Introduction of Vocal in Kathak Dance | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **PC-PG2 4 credit Select one Option** | B23-PAS-805 | Vocal Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-815 | Sitar Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-825 | Tabla Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| | B23-PAS-835 | Kathak Stage Performance | 4 | 4 | 30 | 70 | 100 | 6 hrs. |
| **CC-PGM2 4 credit** | From the available courses as per NEP Ordinance | | | | | | | |

*The Course Codes according to different specializations are given below

Sem X – Course 1001 is Compulsory for all students , Vocal -1002,803,804,805 ,Sitar- 1012-813,814,815 ,Tabla – 1022 ,823,824,825, Kathak - 1032,833,834,835,

| (Fifth Year: Semester-10) for those who have not done Dissertation at 8th semester | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Course** | **Paper(s)** | **Nomenclature ofPaper** | **Credits** | **Hours / Week** | **Internal marks** | **External Marks** | **Total Marks** | **Exam Duration** |
| **CC-PG4** | B23-PAS-1001 | Research Methodology | 3+1 | 4 | 30 | 70 | 100 | 3 hrs. |
| **CC-PG5 4 credit Select one option** | B23-PAS-1002 | Interdisciplinary Aspects of Indian Music | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | Practical | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | B23-PAS-1012 | New concepts in musical instruments | | | | | | |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-1022 | Ancient and Medieval History of Hindustani Percussion Instruments | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | B23-PAS-1032 | Study of Folk Dances Of Different Zone of India | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Project/ Dissertation12 credit** | B23-PAS-1006 | **Project/Dissertation** | 8+4 | - | - | - | - | - |
| **Project/ Dissertation12 credit** | B23-PAS-1016 | **Project/Dissertation** | 8+4 | - | - | - | - | - |
| **Project/ Dissertation 12 credit** | B23-PAS-1026 | **Project/Dissertation** | 8+4 | - | - | - | - | - |
| **Project/ Dissertation 12 credit** | B23-PAS-1036 | **Project/Dissertation** | 8+4 | - | - | - | - | - |
| **CC-PGM2 4 credit** | From the available courses as per NEP Ordinance | | | | | | | |

*The Course Codes according to different specializations are given below

Sem X – Course 1001 is Compulsory for all students , Vocal -1002 to1006 ,Sitar- 1012-1016 ,Tabla – 1022-1026 ,Kathak -1032-1036

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**
**(5 Year Integrated Programme)**
**Under NEP- 2020 W.E.F. 2023-24**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Music Vocal | | |
| Semester | Ist | | |
| Name of the Course | Concepts of Indian Music | | |
| Course Code | B23-PAS-101 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-A1 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | N.A. | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Enhance his/her knowledge about different types of music<br>2. Enhance his/her knowledge about Sound and scientific aspects of Music<br>3. Enhance his/her knowledge about basic terminology of Music.<br>4 Enhance his/her knowledge about given ragas and taalas and able to write notation<br>5*.Practically demonstrate or Perform the given Contents | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | **Time:** 3 Hours (Theory) and<br>**6** Hours Practical |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus, it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.
6. . The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **1. Aspects of Indian Music**<br>I.I Aspects of music ,practical and theory<br>I.2 Music and its types – Classical , Semi Classical , Folk Music and Light music. | 8 |
| II | **2. Music and Sound**<br>2.1 Sound ,Musical Sound ,Vibration , Frequency.<br>2.2 Naad and its types Aahat naad ,Anahad Naad.Pitch Intansity ,Timber | 8 |
| III | **3. Terms of Indian Music**<br>3.1 Shruti ,Swar ,Shuddha Swar, Vikrit Swar ,<br>3.2 Saptak and its types , Madhya, Mandra and Taar Saptak<br>3.3 Meaning ,definition and types of Varn<br>3.4 Meaning ,definition and types of Alankar | 7 |
| IV | **4. Raga and Taalas**<br>4.1Detailed description and Ability to write natation of following Drut Khyals with alaps and Taans<br>Bilawal, Yaman ,<br>4.2 Detail description of following taalas and ability to write in taal lipi in Thah and Dugun layakaries<br>Teen Taal , Kaharwa | 7 |

| | | |
|---|---|---|
| **V*** | **Practical**<br>5.1 Drut Khyals with alaps and Taans<br>Bilawal, Yaman ,<br>5.2 Detail description of following talas :<br>Teen Taal , Kaharwa | 60 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment: 30(15+15*)**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: 4<br>• Mid-Term Exam: 7<br>➢ **Practicum**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: | | **End Term Examination:**<br>70 (35+35*) |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande<br>2. Kramik Pustak Mallika- Part II V. N. Bhatkhande<br>3. Sangeet Bodh – Sharad Chandra Pranjpayee<br>4. Hamare Sangeet Ratna- Laxmi Narayan Garg<br>5. Raag Parichay Part (1-2) - Harishchand Shrivastav | | |

*Applicable for courses having practical component.

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**
**(5 Year Integrated Programme)**
**Under NEP- 2020 W.E.F. 2023-24**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Music Vocal | | |
| Semester | IInd | | |
| Name of the Course | Concept of Raga in Indian Classical Music | | |
| Course Code | B23-PAS-201 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-A2 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | N.A. | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Enhance his/her knowledge about various aspects of Indian music .<br>2. Enhances knowledge about various musical forms.<br>3. Enhance his/her knowledge about basic terminology of Taal and develops the ability to write Talas in Taal lipi<br>4. 4 Enhance his/her knowledge about given ragas and taalas and able to write notation<br>5*.Practically demonstrate or Perform the given Contents | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | **Time:** 3 Hours (Theory) and<br>**6** Hours Practical |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

7. There shall be Nine Questions in all.
8. The Question paper will be divided into five units.
9. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
10. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus, it contains 5 objective type questions of two marks each.
11. All questions Carry equal marks.
12. . The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **1. Concept of Raga in Indian Classical Music**<br><br>1.1 Meaning and definition of Raga<br>1.2 Raga Lakshan<br>1.3 Jaties of Ragas | 8 |
| II | **2. Terminology of Ragas**<br><br>2.1 Raga , Vadi , Samvadi and Vivadi swar, Aroh ,Awroh ,Pakad ,Samprakartik Raga , Gayan Samay, Aasraye Ragas | 8 |
| III | **3. Classification of Ragas**<br>3.1 Different types of Classification of Ragas<br>3.2 Detailed study of Mel system in classical music<br>3.3 Knowledge of thaat system and Ten Thaats of pt. Bhatkhande | 7 |
| IV | **Ragas and Taalas**<br>4.1 Detailed description and Ability to write natation of Vilambit and Drut khyals of following ragas with alaps and Taans<br>Durga , Bhupali<br>4.2 Detail description of following taalas and ability to | 7 |

| | | |
|---|---|---|
| | write in taal lipi in Thah and Dugun layakaries<br>Ektaal ,Dadra | |
| **V*** | **Practical**<br><br>5.1 Vilambit and Drut Khyals with alaps and Taans in following ragas<br>Durga , Bhupali<br>5.2 Detail description and ability to demonstrate following talas :<br>Ektaal ,Dadra | 60 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment: 30(15+15*)**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: 4<br>• Mid-Term Exam: 7<br>➢ **Practicum 15**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: | | **End Term Examination:**<br>70 (35+35*) |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande<br>2. Kramik Pustak Mallika- Part II V. N. Bhatkhande<br>3. Sangeet Bodh – Sharad Chandra Pranjpayee<br>4. Hamare Sangeet Ratna- Laxmi Narayan Garg<br>5. Raag Parichay Part (1-2) - Harishchand Shrivastav | | |

*Applicable for courses having practical component.

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**
**(5 Year Integrated Programme)**
**Under NEP- 2020 W.E.F. 2023-24**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Music Vocal | | |
| Semester | IIIrd | | |
| Name of the Course | Principles of North Indian Classical Music | | |
| Course Code | B23-PAS-301 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-A3 | | |
| Level of the course (As per Annexure-I | 200-299 | | |
| Pre-requisite for the course (if any) | N.A. | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Enhance his/her knowledge about basic terminology of music and scientific aspects of sound<br>2. Enhance his/her knowledge about the application of basic terminology of music and various theories of Indian classical music .<br>3. Know how to write the notation of Vilambit and Drut khyals with Taans and Alaps .<br>4. know about various Vocal forms and contribution of famous musician<br>_____<br>5*.Practically demonstrate or Perform the given Contents | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | **Time:** 3 Hours (Theory) and<br>**6** Hours Practical |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus, it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.
6. . The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Placement of Swaras**<br>1.1 Placement of Swaras on Shruties by following authors Bharat ,Matang, Loochan,Pundrik Vitthal and Ramamatya<br>1.2 Sarna Chatushtayi by Bharat<br>Avirbhav –Tirobhav, Nayak-Nayaki | 8 |
| II | **Concept of Gram and Murchchhna**<br>2.1 Meaning and definition of Gram<br>2.2 Different types of Gram – Madhyam , Shadaj and Gandhar<br>2.3Meaning and defination of Murchchhna<br>2.4 Detailed study of Dwadash Swar Murchchhna | 8 |
| III | **Taanpura and Sahayak Naad**<br>3.1 Tanpura and Sahayak Naad<br>3.2 Knowledge about different parts of Taanpura | 7 |
| IV | **Ragas and Taalas**<br>Detailed description and ability to write notation of one Vilambit and drut khyals following ragas with alaps and taans.<br>Bhairav , Kafi<br>1. Detailed description and ability to write notation of | 7 |

| | | |
|---|---|---|
| | following talas inThah, Dugun and Tigun layakaries :<br>Tivra, Rupak, Dadra | |
| **V*** | **Practical**<br><br>2. One Vilambit and Drut khyal in raga Bhairav with alaps and taans.<br>3. Drut khyal in raga Kafi with comparative study of ragas<br>4. Study of following talas with detailed Demonstrate inThah Dugun and Tigun layakaries :<br>Tivra, Rupak, Dadra | 60 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment: 30 (15+15*)**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: 4<br>• Mid-Term Exam: **7**<br>➢ **Practicum 10**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: | | **End Term Examination:**<br>(35+35*) |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande<br>2. Kramik Pustak Mallika- Part II V. N. Bhatkhande<br>3. Sangeet Bodh – Sharad Chandra Pranjpayee<br>4. Hamare Sangeet Ratna- Laxmi Narayan Garg<br>5. Raag Parichay Part (1-2) - Harishchand Shrivastav | | |

*Applicable for courses having practical component.

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**
**(5 Year Integrated Programme)**
**Under NEP- 2020 W.E.F. 2023-24**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Music Vocal | | |
| Semester | IVth | | |
| Name of the Course | History of Indian Music | | |
| Course Code | B23-PAS-401 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-A4 | | |
| Level of the course (As per Annexure-I | 200-299 | | |
| Pre-requisite for the course (if any) | N.A. | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Enhance his/her knowledge about historical development of music in Vedic and post vedic<br>2. Enhance his/her knowledge about prescribed ragas and talas with the ability to write notation.<br>3. Enhance his/her knowledge about development of music in medieval period<br>4. Enhance his/her knowledge about music in Musical treatise<br>_____<br>5*.Practically demonstrate or Perform the given Contents | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | **Time:** 3 Hours |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

7. There shall be Nine Questions in all.
8. The Question paper will be divided into five units.
9. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
10. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus, it contains 5 objective type questions of two marks each.
11. All questions Carry equal marks.
12. . The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| **I** | 1.1Music in Vedas<br>1.2Music in Puranas<br>1.3Musicn in Ramayana<br>1.4Music in Mahabharata | 8 |
| **II** | 2.1 Historical development of Indian Music in Medieval Period<br>2.2 Historical development of Indian Music in Modern Period | 8 |
| **III** | Music in Historical Treatise<br>a. Natya Shastra<br>b. Brihaddeshi<br>c. Sangeet Ratnakar | 7 |
| **IV** | Ragas and Taalas<br>Detail Description,comparative study and ability to write notation of one vilambit and drut khyals with alaps and taans. in rags prescribed in syllabus<br>Malkauns , Kedar ,<br>2. Ability to write the following taalas in taal lipi in Thah Dugun and Tigun layakaries :<br>Ada Chautaal , Deepchandi, | 7 |

| | | |
|---|---|---|
| **V*** | **Practical**<br><br>3. One Vilambit and Drut khyal in each ragas of prescribed syllabus with alaps and taans.<br>Malkauns , Kedar ,<br>a) Detail Description and comparative study of ragas prescribed in syllabus<br>b) Ability to demonstrate the following taalas in Thah Dugun and Tigun layakaries :<br>Ada Chautaal , Deepchandi, | 60 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment: 30(15+15*)**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: 4<br>• Mid-Term Exam: 7<br>➢ **Practicum-**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: | **End Term Examination:**<br>70 (35+35*) |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande
2. Kramik Pustak Mallika- Part II V. N. Bhatkhande
3. Sangeet Bodh – Sharad Chandra Pranjpayee
4. Hamare Sangeet Ratna- Laxmi Narayan Garg
5. Raag Parichay Part (1-2) - Harishchand Shrivastav

*Applicable for courses having practical component.

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**
**(5 Year Integrated Programme)**
**Under NEP- 2020 W.E.F. 2023-24**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Music Vocal | | |
| Semester | IVth | | |
| Name of the Course | Various Forms of Hindustani Classical Music | | |
| Course Code | B23-PAS-404 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M4 | | |
| Level of the course (As per Annexure-I | 200-299 | | |
| Pre-requisite for the course (if any) | N.A. | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>5. Enhance his/her knowledge about given classical music Vocal forms of Medieval period<br>6. Enhance his/her knowledge about given classical music Vocal forms of Medieval period<br>7. Enhance his/her knowledge about given classical music Vocal forms<br>8. Enhance his/her knowledge about given semi-classical music Vocal music of music<br>_____<br>5*.Practically demonstrate or Perform the given Contents | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | **Time:** 3 Hours |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus, it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.
6. . The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| **I** | 1.1 Dhruva Gayan<br>1.2 Prabandh Gayan<br>1.3 Jati Gayan | 8 |
| **II** | 2.1 Dhrupad Gayan ,<br>2.2 Dhmar Gayan<br>2.3 Gities and various types of Gities | 8 |
| **III** | 3.1 Thumri Gayan<br>3.2 Tappa Gayan<br>3.3 Trivat ,Chaturang, Dadra , Kajri, Chaiti | 7 |
| **IV** | 1. Detail Description and comparative study of ragas prescribed in syllabus<br>2. Ability to write notation of One Vilambit and Drut khyals in each ragas of prescribed syllabus with alaps and taans.<br>Malkauns , Kedar ,<br>3. Ability to write the following taalas in taal lipi in Thah, Dugun and Tigun layakaries :<br>Ada Chautaal , Deepchandi, | 7 |
| **V*** | **Practical**<br>4. One Vilambit and Drut khyal in each ragas of prescribed syllabus with alaps and taans. | 60 |

| | | |
|---|---|---|
| | Malkauns , Kedar ,<br>5. Detail Description and comparative study of ragas prescribed in syllabus<br>6. Ability to demonstrate the following taalas in Thah Dugun and Tigun layakaries :<br>Ada Chautaal , Deepchandi, | |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment: 30(15+15*)**<br>➢ **Theory -**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.: 15<br>• Mid-Term Exam:<br>➢ **Practicum-**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 15<br>• Mid-Term Exam: | | **End Term Examination:**<br>70 (35+35*) |
| **Part C-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande<br>2. Kramik Pustak Mallika- Part II V. N. Bhatkhande<br>3. Sangeet Bodh – Sharad Chandra Pranjpayee<br>4. Hamare Sangeet Ratna- Laxmi Narayan Garg<br>5. Raag Parichay Part (1-2) - Harishchand Shrivastav | | |

*Applicable for courses having practical component.

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**
**Syllabus and Course of Reading for Master of Performing Arts**
**(5 Year Integrated Programme)**
**Under NEP-2020 W.E.F. 2023-24**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A – Introduction** | | | |
| Subject | **Music instrumental (Sitar)** | | |
| Semester | I | | |
| Name of the Course | Basic Introduction of String Instruments | | |
| Course Code | B23-PAS-101 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-B1 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>**1 Developed Capability to write composition with notation and Knowledge about Ragas.**<br>**2. Enhances Knowledge about Taals.**<br>**3. Knowledge about different terms of Indian Classical Music.**<br>**4. Knowledge about the contribution of great maestros.**<br>5*. Practically demonstrate or Perform the given Contents | | |
| Credits | Theory | **Practical** | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks:100 (50+50*)**<br>**Internal Assessment Marks:30 (15+15*)**<br>**End Term Exam Marks:** 70 (35+35*) | **Time: Time:** 3 Hours (Theory) /<br>**6 Hours (**Practical) |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

There shall be **Nine** Questions; Question number **one** must be objective type which is compulsory. The candidate is required to attempt **FIVE** questions in all, selecting **ONE** question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | i) Definition of Vadya<br>ii) Importance of string instruments.<br>iii) | 8 |
| II | i) Veena : An ancient string instrument<br>ii) Types of Veena | 8 |
| III | i) Classification of Indian classical musical Instruments.<br>ii) Importance of Folk Instruments. | 7 |
| IV | A. Relationship between Folk and Classical Music.<br>B. Contribution towards music of the following :-<br>Pt. Ravi Shankar, Ustad Vilayat Khan, | 7 |
| V* | **Practical**<br>B**)** One Drut Gat in Raag Bhupali With Two Toras.<br>A. Historical study and detailed description of the Ragas as given below –Bhupali<br>B. Ability to play Razakhani Gat of Ragas on Sitar- Bhupali<br>C. Vande Mataram on Sitar<br>D. Five Alankars on Sitar in Shuddha Swaras | 60 |

**Suggested Evaluation Methods**

| InternalAssessment: 30 (15+15*) | End Term Examination: (35+35*) |
|---|---|
| ➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.:**4**<br>• Mid-Term Exam: 7<br>➢ **Practicum:**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **10**<br>• Mid-Term Exam: | |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>Raag Shastra- Dr. Geeta Banarjee<br>Taal Parichay- Bhaag 1 –Pt.Girish Chandra Srivastava<br>Sitar and its compositions- Dr. Vinay Kumar Aggrawal<br>Hamare Sangeet Ratna – Luxmi Narayan Garg<br>Bhartiya Sangeet ka Itihas – Sharat Shridhar Paranjpe |

*Applicable for courses having practical component.

**MPA (Instrumental- Sitar) Semester – II**

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A – Introduction** | | | |
| Subject | **Music Instrumental -Sitar** | | |
| Semester | II | | |
| Name of the Course | Technical Aspects of Sitar | | |
| Course Code | B23-PAS-201 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-B2 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>**1 Developed Capability to write composition with notation and Knowledge about Ragas.**<br>**2. Enhances Knowledge about Taals and its different terms.**<br>**3. Knowledge about structural and historical aspects of Sitar.**<br>**4. Knowledge about the contribution of Media in music popularity.**<br>5*. | | |
| Credits | Theory | **Practical** | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |
| **Max. Marks:100 (50+50*)**<br>**Internal Assessment Marks:30 (15+15*)**<br>**End Term Exam Marks:** 70 (35+35*) | | **Time: Time:** 3 Hours (Theory) / **6 Hours (**Practical) | |

| Part B- Contents of the Course | | |
|---|---|---|
| **Instructions for Paper- Setter**<br>There shall be **Nine** Questions; Question number **one** must be objective type which is compulsory. The candidate is required to attempt **FIVE** questions in all, selecting **ONE** question from each unit. All questions carry equal marks. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | A. Sitar ke Gharane<br>B. Contribution towards music of the following :-<br>Pt. Nikhil Bainarjee, Ustad Imdad Khan, | 8 |
| II | A. Introduction to the following terms :<br>Mizrab, Baithak, Maseetkhani Gat, Razakhani Gat<br>B. Detailed description of the following : Meend, Ghaseet, Krintan, Alaap, Tora, Jhala, Mukhada, Sam, Vibhag, Zamzama | 8 |
| III | A. Detailed Description of Flute<br>B. Concept of Tumba in String Instruments | 7 |
| IV | A. Role of Media in the development of Indian Classical Music.<br>B. Vadkon ke Gun aur Dosh | 7 |
| V* | **A) Practical-**<br>B) Historical study and detailed description of the Ragas as given below –Yaman, Kafi<br>**C)** Ability to play Raza Khani Gat of above mentioned Ragas.<br>D) A) Ability to play Vande Mataram on Sitar. | 60 |
| **Suggested Evaluation Methods** | | |

| InternalAssessment: 30 (15+15*) | End Term Examination: (35+35*) |
|---|---|
| ➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.:**4**<br>• Mid-Term Exam: 7<br>➢ **Practicum:**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **10**<br>• Mid-Term Exam: | |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>Raag Shastra- Dr. Geeta Banarjee<br>Taal Parichay- Bhaag 1 –Pt.Girish Chandra Srivastava<br>Sitar and its compositions- Dr. Vinay Kumar Aggrawal<br>Hamare Sangeet Ratna – Luxmi Narayan Garg<br>Bhartiya Sangeet ka Itihas – Sharat Shridhar Paranjpe |

*Applicable for courses having practical component.

**MPA (Instrumental- Sitar) Semester – III**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A – Introduction** | | | |
| Subject | **Music Instrumental –Sitar** | | |
| Semester | **III** | | |
| Name of the Course | History of Sitar and other Instruments | | |
| Course Code | B23-PAS-301 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-B3 | | |
| Level of the course (As per Annexure-I | 200-299 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>**1 Enhances Knowledge about Taals and Ragas.**<br>**2. Developed Capability to write composition with notation and Knowledge about Ragas.**<br>**3. Knowledge about structural and historical Knowledge of tuning of Sitar.**<br>**4. Knowledge about the contribution of great maestros.**<br>—<br>5*. | | |
| Credits | Theory | **Practical** | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |
| **Max. Marks:100 (50+50*)**<br>**Internal Assessment Marks:30 (15+15*)**<br>**End Term Exam Marks:** 70 (35+35*) | | **Time: Time:** 3 Hours (Theory) / **6 Hours (**Practical) | |
| **Part B- Contents of the Course** | | | |

| **Instructions for Paper- Setter** | | |
|---|---|---|
| There shall be **Nine** Questions; Question number **one** must be objective type which is compulsory. The candidate is required to attempt **FIVE** questions in all, selecting **ONE** question from each unit. All questions carry equal marks. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | A. Historical Development of Sitar<br>B. Parts of Sitar<br>C. Importance of Sitar among string instruments | 8 |
| II | A. Short Notes on the following terms:<br><br>Alpatva-Bahutva, Nad, Shruti, Laya, Amir Khani Gat , Firozkhani Gat and Avirbhav-Tirobhava. | 8 |
| III | A. Sushir Vadya : Bansuri, Shehnai, Clarnet<br>B. Tantri Vadya : Sarangi, Santoor, Violin | 7 |
| IV | A. Contribution towards Music of the following:<br><br>1. Abdul Halim Zafar Khan<br>2. Pt. Debu Chaudhary<br>3. Ustad Inayat Khan<br>4. Pt. Manilal Naag | 7 |
| V* | Practical<br>A. ii) Historical study and detailed description of the Ragas prescribed in the syllabus.<br><br>Ragas : Bhairav and Vrindavani Sarang<br>B**) i)** One Drut Gat in Raag Bhairav and Raag Vrindavani Sarang With Two Toras.<br>ii) Ability to play National Anthem on Sitar. | 60 |
| **Suggested Evaluation Methods** | | |

| InternalAssessment: 30 (15+15*) | End Term Examination: (35+35*) |
|---|---|
| ➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.:**4**<br>• Mid-Term Exam: 7<br>➢ **Practicum:**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **10**<br>• Mid-Term Exam: | |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>Raag Shastra- Dr. Geeta Banarjee<br>Taal Parichay- Bhaag 1 –Pt.Girish Chandra Srivastava<br>Sitar and its compositions- Dr. Vinay Kumar Aggrawal<br>Hamare Sangeet Ratna – Luxmi Narayan Garg<br>Bhartiya Sangeet ka Itihas – Sharat Shridhar Paranjpe |

*Applicable for courses having practical component.

**MPA (Instrumental- Sitar) Semester – IV**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | **Music Instrumental -Sitar** | | |
| Semester | IV | | |
| Name of the Course | Technical aspects of Sitar Education | | |
| Course Code | B23-PAS-401 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-B4 | | |
| Level of the course (As per Annexure-I | 200-299 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>**1 Enhances Knowledge about Ragas and Taals.**<br>**2. Developed Capability to write composition with notation and Knowledge about different terms of classical music.**<br>**3. Knowledge of history of music.**<br>**4. Knowledge about the contribution of science and knowledge of other musical instruments.**<br>5*. | | |
| Credits | Theory | **Practical** | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |
| **Max. Marks:100 (50+50*)**<br>**Internal Assessment Marks:30 (15+15*)**<br>**End Term Exam Marks:** 70 (35+35*) | | **Time: Time:** 3 Hours (Theory) / **6 Hours (**Practical) | |
| **Part B- Contents of the Course** | | | |

| Instructions for Paper- Setter | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | A. Time theory of Ragas<br>B. Importance of Radio and Television in Music | 8 |
| II | A. Short Notes on the following terms:<br><br>Parmel –Praveshak -Raag, Sandhi –Pakash- Raagas, Gram, Murchhana and Lakshan Geet, Sangat, Jugalbandi | 8 |
| III | A. Concept of Electronic Musical Instruments<br>B. Write about Aahat Naad and Anahat Naad in detail. | 7 |
| IV | A. Contribution towards Music of the following:<br><br>Ustad Shahid Parvez Khan, Pt. Buddhaditya Mukharji, Ustad Shujat Khan<br>B. Role of Science in promoting the Educational and Cultural aspects of Music during modern period.<br>C. Detailed description of the following Instruments : Tabla and Pakhawaj | 7 |
| V* | Practical<br><br>A. Historical study and detailed description of the Ragas prescribed in the syllabus.<br><br>Deshkar, Bahar<br>Ability to play National Anthem on Sitar.<br>B) One Drut Gat in Deshkar, Bahar With Two Toras.<br>C) Five Alankars in Komal Swaras. | 60 |
| **Suggested Evaluation Methods** | | |

| InternalAssessment: 30 (15+15*) | End Term Examination: (35+35*) |
|---|---|
| ➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.:**4**<br>• Mid-Term Exam: 7<br>➢ **Practicum:**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **10**<br>• Mid-Term Exam: | |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>Raag Shastra- Dr. Geeta Banarjee<br>Taal Parichay- Bhaag 1 –Pt.Girish Chandra Srivastava<br>Sitar and its compositions- Dr. Vinay Kumar Aggrawal<br>Hamare Sangeet Ratna – Luxmi Narayan Garg<br>Bhartiya Sangeet ka Itihas – Sharat Shridhar Paranjpe |

*Applicable for courses having practical component.

**MPA (Instrumental- Sitar) Semester – IV**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | **Music Instrumental -Sitar** | | |
| Semester | IV | | |
| Name of the Course | Musical Instruments : History and Structure | | |
| Course Code | B23-PAS-401 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC-M4 | | |
| Level of the course (As per Annexure-I | 200-299 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>**1 Enhances Knowledge about Ragas and Taals.**<br>**2. Developed Capability to write composition with notation and Knowledge about different terms of classical music.**<br>**3. Knowledge of history of music.**<br>**4. Knowledge about the contribution of science and knowledge of other musical instruments.**<br>5*. | | |
| Credits | Theory | **Practical** | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |
| **Max. Marks:100 (50+50*)**<br>**Internal Assessment Marks:30 (15+15*)**<br>**End Term Exam Marks:** 70 (35+35*) | | **Time: Time:** 3 Hours (Theory) / **6 Hours (**Practical) | |
| **Part B- Contents of the Course** | | | |

| Instructions for Paper- Setter | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | A. Detailed description of Sitar<br>B. Veena : Tantri Vadyon ki Janani | 8 |
| II | A. Short Notes on the following terms:<br><br>Daand, Targahan, Atti, Manka, Gudri, Thaap, Tihaie, Jod Jhala, Jamjama, Soot,<br>B. Use of frets (Parda) in String Instruments. | 8 |
| III | A. Ghan Vadya : Ghanta, Ghanti, Chimta, Kansya taal<br>B. Folk Instruments : Dholak, Khadtaal, Dhapli, Nagara, Algoja | 7 |
| IV | D. Contribution towards Music of the following:<br><br>Ustad Abdul Haleem Jafar Khan, Pt. Kartik Kumar, Ustad Rais Khan, Pt. Lalmani Mishra<br>E. Role of Science in promoting the Educational and Cultural aspects of Music during modern period.<br><br>F. Detailed description of the following Instruments : Shankh, Flute, Sarod and Mridang | 7 |
| V* | Practical<br>B. Historical study and detailed description of the Ragas prescribed in the syllabus.<br><br>Puriya Dhanashri, Miyan Malhar, Bahar<br>Ability to play National Anthem on Sitar.<br>B) One Maseetkhani Gat in Raag Puriya Dhanashri and Razakhani Gat in Miyan Malhar, Bahar With Two Toras. | 60 |
| **Suggested Evaluation Methods** | | |

| Internal Assessment: 30 (15+15*) | End Term Examination: (35+35*) |
|---|---|
| ➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.:**4**<br>• Mid-Term Exam: 7<br>➢ **Practicum:**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **10**<br>• Mid-Term Exam: | |

| Part C-Learning Resources |
|---|
| **Recommended Books/e-resources/LMS:**<br>Raag Shastra- Dr. Geeta Banarjee<br>Taal Parichay- Bhaag 1 –Pt.Girish Chandra Srivastava<br>Sitar and its compositions- Dr. Vinay Kumar Aggrawal<br>Hamare Sangeet Ratna – Luxmi Narayan Garg<br>Bhartiya Sangeet ka Itihas – Sharat Shridhar Paranjpe |

*Applicable for courses having practical component.

KURUKSHERTRA UNIVERSITY KURUKSHETRA

**Syllabus and Course of Reading for Master of Performing Arts**

**(5 Year Integrated Programme)**

**Under NEP-2020 W.E.F. 2023-24**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | **Music Instrumental –Tabla** | | |
| Semester | **I** | | |
| Name of the Course | Fundamentals of Percussion instruments | | |
| Course Code | B23-PAS-103 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-C1** | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | NA | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. **Knowledge about structure of tabla and basic terms.**<br>**2. Capability to write composition with notation.**<br>**3. Memorizing taals and contribution of great maestro.**<br>**4. Knowledge of percussion instruments & essay writing skill.**<br>5*<br>1. **Capacity to comprehend principles and fundamentals of Taal and laya.**<br>**2. Develops aptitude about the Laya and Citation.**<br>**3. Knowledge of systematic solo performance.**<br>**4. Effective accompaniment** | | |
| Credits**: 4** | **Theory** | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (15+15*)** | **Time:** 3 Hours |

**Part B- Contents of the Course**

There shall be **Nine** Questions; Question number **one** must be objective type which is compulsory. The candidate is required to attempt **FIVE** questions in all, selecting **ONE** question from each unit. All questions carry equal marks.
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| Unit | Topics | Contact Hours |
|---|---|---|
| I | A) Introduction of different parts of Tabla in brief with sketch.<br>B) Definitions of the following:Taal, Laya,Taali, Khali, Matra, Vibhag,Sam,Kayda, Palta, Tukda ,Tihai. | 8 |
| II | A) Brief Knowledge of Bhatkhande notation system.<br>B) Ability to write Theka, Kayda, Palta and Tihaai in Teentaal with notation. | 8 |
| III | A) Introduction of the following taals in brief: Teentaal, Dadra. | 7 |
| IV | A) Knowledge of Basic syllables of Tabla.<br>Ten Varna, Sanyukta-Varna, | 7 |
| V* | **Practical**<br>A) Practical knowledge of the basic syllables of Tabla (Dahina and Bayan) like:<br>NA, GE, DHA, DHIN, DIN, GHE, TE, TE etc.<br>B) One Kayda in Teentaal With Two Palta and Tihai.<br>C) Ability to play Theka and its variations in Thah and<br>Dugun of Teentaal.<br>D) Practice of Theka recitation of Teentaal on hand. | 60 |

| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment: 30 (15+15*)**<br>➢ **Theory 15**<br>• Class Participation: **4**<br>• Seminar/presentation/assignment/quiz/class test etc.:**4**<br>• Mid-Term Exam: **7**<br>➢ **Practicum: 15**<br>• Class Participation: **5**<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **10**<br>• Mid-Term Exam: | **End Term Examination: 70 (35+35*)** |
| **Part C-Learning Resources** | |
| **Recommended Books/e-resources/LMS:**<br>Taal Parichay- Bhaag 1 –Pt.Girish Chandra Srivastava<br>Taal Prasoon –Bhag 1- Pt. Chhotelal Mishra<br>Taal Sarvang- Dr.Vidyanaath Singh<br>Taal Deepika- Mannu ji Mridangacharya | |

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**
**Syllabus and Course of Reading for Master of Performing Arts**
**(5 Year Integrated Programme)**
**Under NEP-2020 W.E.F. 2023-24**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | **Music Instrumental –Tabla** | | |
| Semester | **II** | | |
| Name of the Course | Basic Introduction of Tabla & Musicology. | | |
| Course Code | B23-PAS-203 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC –C2 | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. **Knowledge about origin of Percussion instruments.**<br>**2. Comprehensive assertion of Tabla.**<br>**3. Knowledge of basic taals.**<br>**4. Knowledge of Popular percussion instrument.**<br>5*. Practically demonstrate or Perform the given Contents | | |
| Credits**: 4** | **Theory** | Practical | Total |
| | 3 | 1 | 4 |
| Contact Hours | 2 | 4 | 6 |
| **Max. Marks: 100 (70+30*)**<br>**Internal Assessment Marks: 30 (20+10*)**<br>**End Term Exam Marks: 70 (50+20*)** | | **Time:** 3 Hours | |
| **Part B- Contents of the Course** | | | |
| **Instructions for Paper- Setter** | | | |

| There shall be **Nine** Questions; Question number **one** must be objective type which is compulsory. The candidate is required to attempt **FIVE** questions in all,selecting **ONE** question from each unit. All questions carry equal marks. | | |
|---|---|---|
| **Unit** | **Topics** | **Contact Hours** |
| I | A) Initiation of Avanaddha Vadyas.<br>(According to Bharat & Sharangdev) | 8 |
| II | A) Review of different opinions on origin of Tabla.<br>(Ancient, Medieval and Modern theory) | 8 |
| III | A) Introduction of the following taals in bief: Kaherwa, Dadra. | 7 |
| IV | A) Knowledge of parts of following percussion instruments: Naal, Pakhawaj. | 7 |
| V* | **Practical**<br>A) Recitation of Teentaal in Barabar, Dugunan, ChaugunLaya.<br>B) One Kayda in Teentaal with Two Palta and Tihai in Teentaal of Tirkit syllables.<br>C) Two Tukda of Teentaal.<br>D) Practice of above mentioned compositions with nagma (Saringi/Harmonium) | 60 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment: 30(15+15*)**<br>➢ **Theory**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.:**4**<br>• Mid-Term Exam: 7<br>➢ **Practicum:**<br>• Class Participation: 5<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **10**<br>• Mid-Term Exam: | | **End Term Examination: 70(35+35)*** |
| **Part C-Learning Resources** | | |

**Recommended Books/e-resources/LMS:**

Taal Parichay- Bhaag 1 –Pt.Girish Chandra Srivastava
Taal Prasoon –Bhag 1- Pt. Chhotelal Mishra
Taal Sarvang- Dr.Vidyanaath Singh
Taal Deepika- Mannu ji Mridangacharya

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**
**(5 Year Integrated Programme)**
**Under NEP- 2020 W.E.F. 2023-24**

# MPA IV Sem

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | **Music Instrumental -Tabla** | | |
| Semester | **IV** | | |
| Name of the Course | Teaching System of Tabla and its development | | |
| Course Code | B23-PAS-406 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | **CC-M4 (V)** | | |
| Level of the course (As per Annexure-I | 200-299 | | |
| Pre-requisite for the course (if any) | NA | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. **Enhances the knowledge of musical terms.**<br>**2. Capability to differentiate instruments.**<br>**3. Knowledge about great performers of tabla and various singing styles.**<br>**4. Knowledge of notation with laykari and musical traditions.**<br>5*<br>1. **Capacity to comprehend principles and fundamentals of Taal and laya.**<br>**2. Develops aptitude about the laya and citation.**<br>**3. Knowledge of systematic solo performance.**<br>**4. Effective accompaniment** | | |
| Credits **: 4** | **Theory** | Practcal | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| Max. Marks: 100 (50+50))<br>Internal Assessment Marks: 30 (15+15*)<br>End Term Exam Marks: 70(35+35*) | Time: 3 Hours |
|---|---|

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

There shall be **Nine** Questions; Question number **one** must be objective type which is compulsory. The candidate is required to attempt **FIVE** questions in all, selecting **ONE** question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | A) Historical Evaluation & Developments of Gharanas of Tabla. Delhi, Punjab,Ajrada, Lucknow, Banaras, Farrukhabad | 8 |
| II | A) Brief study of Pakahawaj Gharana- Kudau Singh and Nana Panse | 8 |
| III | A) Brief study of Baaj and its Characteristics- Porab Baj And Pashchim Baj | 7 |
| IV | A) Brief knowledge of characteristics of prominent Gharanas. Playing Techniques, Bols And Compositions | 7 |
| V* | **Practical-**<br>A) Praactice of Theka in Teentaal.<br>B) Tigun and chaugun Layakari of Teentaal.<br>C) Knowledge of Theka of the following Taals: Jhaptaal, Ektaal,<br>D) Demonstration of one kayda of Adi Laya in Teentaal with its Paltas & Tihai with two Tukda & One Chakkardar. | 60 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment: 25 (20+05*)**<br>➢ **Theory 15**<br>• Class Participation: **4**<br>• Seminar/presentation/assignment/quiz/class test etc.: **4**<br>• Mid-Term Exam**: 7**<br>➢ **Practicum 15**<br>• Class Participation:**5**<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **10**<br>• Mid-Term Exam: | **End Term Examination: 70 (35+35*)** |
| **Part C-Learning Resources** | |
| **Recommended Books/e-resources/LMS:**<br>Taal Parichay- Bhaag 2 –Pt.Girish Chandra Srivastava<br>Bhartiya Sangit Vadya- Pt. Lalmani Mishra<br>Taal Vadya Shastra- Bhalchandra Rao Marathe | |

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**
**(5 Year Integrated Programme)**
**Under NEP- 2020 W.E.F. 2022-23**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **PartA - Introduction** | | | |
| Subject | Kathak | | |
| Semester | IIIrd | | |
| Name of the Course | Introduction of Indian Dance | | |
| Course Code | B23-PAS-303 | | |
| CourseType: | **CC-C3** | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | NA | | |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Knowledge of basic structure of Kathak Dance.<br>2. Knowledge of basic syllables of Kathak Dance.<br>3. Knowledge of basic Talas of Kathak Dance.<br>4. Knowledge of basic Layakari of Taal of Kathak Dance.<br>5*.Perform Basics of Kathak on Stage | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |
| **Max. Marks:100 (50+50)**<br>**Internal Assessment Marks:30 (15+15*)**<br>**End Term Exam Marks:70(35+35*)** | | **Time:** 3 Hours | |
| **PartB-Contentsofthe Course** | | | |
| **Instructions for Paper- Setter**<br>There shall be Nine Questions;Question number one must be objective type which is compulsory.The Candidate is required to attempt Five questions in all,selecting one question from each unit.All | | | |

| | | |
|---|---|---|
| questions carry equal marks. | | |
| **Unit** | **Topics** | **Contact Hours** |
| I | A. Meaning, definition and Kinds of the following terms-<br>a)- Kala, b)- Lalit Kala, c)- Sangeet, d)-Natya, e)-Nritt, f)- Nritya<br>. | 8 |
| II | A.History and Origin of Kathak Dance<br>. | 8 |
| III | A. Detail study of Gharana and its Importance in Kathak dance | 7 |
| IV | A. Ability to write the full description of the following Taals with notation of Thaah, Dugun, and ChaugunLayakaris:- a)-Teen Taal, b)Dadra | 7 |
| V* | Practical demonstration of Teentaal –<br>1.Tatkar in Thaah, Dugun & Chaugun Layakaries.<br>2. Ability to take spins of 5 feet & 3 feet .<br>3. 5 types of handmovements with tatkar.<br>4.Thaat, Amad, tihai & two simple tukras<br>5. Padhant of Thah, Dugun & Chaugun layakaries on hand of the following taals with its introduction -<br>a) Teentaal b) Dadra | 60 |
| **SuggestedEvaluationMethods** | | |
| **InternalAssessment:30 (15+15*)**<br>➢ **Theory 15**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: 4<br>• Mid-Term Exam: 7<br>➢ **Practicum 15**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: | | **End Term Examination:**<br>70 (35+35*) |

| PartC-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1. Kathak Nritya Shiksha Part-1(by- Dr. Puru Dadheech)<br>2. Kathak Nritya Shiksha Part- 2 (by- Dr. Puru Dadheech)<br>3. AitihasikParipekshya me Kathak Nritya ( By. Dr. Maya Tak)<br>4. Kathak SaundrayatmakShashtriya Nritya ( By- Shikha Khare)<br>5. Kathak Nritya ( By- Dr. Laxmi Narayan garg)<br>6. Kathak Gyaneshwari ( By- Pt. Tirath Ram Azad) |

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**
**Syllabus and Course of Reading for Master of Performing Arts**
**(5 Year Integrated Programme)**
**Under NEP- 2020 W.E.F. 2022-23**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **PartA - Introduction** | | | |
| Subject | Kathak | | |
| Semester | IV | | |
| Name of the Course | Therapeutic Aspects of Indian Classical Dance | | |
| Course Code | B23-PAS-403 | | |
| CourseType: | **CC-C4** | | |
| Level of the course (As per Annexure-I | 200-299 | | |
| Pre-requisite for the course (ifany) | NA | | |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Knowledge of basic structure of Kathak Dance.<br>2. Knowledge of basic syllables of Kathak Dance.<br>3. Knowledge of basic Talas of Kathak Dance.<br>4. Knowledge of basic Layakari of Taal of Kathak Dance.<br>5*.Perform Basics of Kathak on Stage | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks:100 (50+50)**<br>**Internal Assessment Marks:30 (15+15*)**<br>**End Term Exam Marks:70(35+35*)** | **Time:** 3 Hours |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

There shall be Nine Questions;Question number one must be objective type which is compulsory.The Candidate is required to attempt Five questions in all,selecting one question from each unit.All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Unit –I**<br>A. General Introduction of the classical dances of india<br>a) Odissi b) Bharatnatyam | 8 |
| II | A. Detailed study of Guru Shishya Parampara. | 8 |
| III | A. Life Skecteches of<br>a) Pt.Bindadin Maharaj ji b) Pt. Sundar Parsad ji | 7 |
| IV | A)- Ability to write the full description of the following Taals with notation of Thaah, Dugun, Tigun and Chaugun Layakaris:- a)- Jhaptaal b)- Kehrwa | 7 |
| V * | Study of **Teen Taal** in detail-<br>1. Tatkar in Thaah, Dugun, and Chaugun Layakaries.<br>2. Thaat , ParanJudi amad, Paran , Kavitt<br>3.Abhinay- Bhajan / Stuti / Vandana<br>4. Padhant of Thah, Dugun & Chaugun layakaries on hand of the following taals with its introduction -<br>a) Jhaptaal b) Kehrwa | 60 |

**SuggestedEvaluationMethods**

| | |
|---|---|
| **InternalAssessment:30 (15+15*)**<br>➢ **Theory 15**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.:4<br>• Mid-Term Exam: 7<br>➢ **Practicum 15**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: | **End Term Examination:**<br>70 (35+35*) |

**PartC-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. Kathak Nritya Shiksha Part-1(by- Dr. Puru Dadheech)
2. Kathak Nritya Shiksha Part- 2 (by- Dr. Puru Dadheech)
3. AitihasikParipekshya me Kathak Nritya ( By. Dr. Maya Tak)
4. Kathak SaundrayatmakShashtriya Nritya ( By- Shikha Khare)
5. Kathak Nritya ( By- Dr. Laxmi Narayan garg)
6. Kathak Gyaneshwari ( By- Pt. Tirath Ram Azad)
7. Kathak Kalapdrum ( By- Dr. Chetna JyotishiBeohar)
8. Kathak ( Indian Classical Dance series) – ( by Shovana Narayan)
9. Abhinaya Darpan ( by- Dr. Puru Dadheech)

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**
**Syllabus and Course of Reading for Master of Performing Arts**
**(5 Year Integrated Programme)**
**Under NEP- 2020 W.E.F. 2022-23**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **PartA - Introduction** | | | |
| Subject | Kathak | | |
| Semester | IV | | |
| Name of the Course | General Introduction of Indian Classical Dance & Folk Dance | | |
| Course Code | B23-PAS-407 | | |
| CourseType: | **CC-M4 (V)** | | |
| Level of the course (As per Annexure-I | 200-299 | | |
| Pre-requisite for the course (ifany) | Na | | |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Knowledge of basic structure of Kathak Dance.<br>2. Knowledge of basic syllables of Kathak Dance.<br>3. Knowledge of basic Talas of Kathak Dance.<br>4. Knowledge of basic Layakari of Taal of Kathak Dance.<br>5*.Perform Basics of Kathak on Stage | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks:100 (50+50)**<br>**Internal Assessment Marks:30 (15+15*)**<br>**End Term Exam Marks:70 (35+35*)** | **Time:** 3 Hours |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

There shall be Nine Questions;Question number one must be objective type which is compulsory.The Candidate is required to attempt Five questions in all,selecting one question from each unit.All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | A.General Introduction of Classical Dance & Folk Dance. | 8 |
| II | A. Impact of Makeup,Costume &Jewellery in Dance. | 8 |
| III | A)- Brief Knowledge of Folk Dance of Haryana & Punjab. | 7 |
| IV | A )Ability to Write the notation of the following in Jhap taal :-<br>a)- Tatkar, b)- Thaat, c)- Tihai, d)- Amad, e)- Tukda, f)- Paran, g)- Paran Judi Amad, h)- Chakardar Paran, i)- Chakardar Tukda, j)- Kavitt k)- Parmelu. | 7 |
| V* | Study of **Jhaptaal** in detail-<br>1. Tatkar in Thaah, Dugun, and Chaugun Layakaries<br>2. Two Thaat &Tihai<br>3.One ParanJudi Amad ,Permelu & chakkardar Tukra<br>4.One chakkardar Paran & Kavitta<br>**5.** One gat nikas in teen taal. | 60 |

| SuggestedEvaluationMethods | |
|---|---|
| **InternalAssessment:30 (15+15*)**<br>➢ **Theory 15**<br>• Class Participation: 4<br>• Seminar/presentation/assignment/quiz/class test etc.: 4<br>• Mid-Term Exam: 7<br>➢ **Practicum 15**<br>• Class Participation: 05<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>• Mid-Term Exam: | **End Term Examination:**<br>70 (35+35*) |

**PartC-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. Kathak Nritya Shiksha Part-1(by- Dr. Puru Dadheech)
2. Kathak Nritya Shiksha Part- 2 (by- Dr. Puru Dadheech)
3. AitihasikParipekshya me Kathak Nritya ( By. Dr. Maya Tak)
4. Kathak SaundrayatmakShashtriya Nritya ( By- Shikha Khare)
5. Kathak Nritya ( By- Dr. Laxmi Narayan garg)
6. Kathak Gyaneshwari ( By- Pt. Tirath Ram Azad)
7. Kathak Kalapdrum ( By- Dr. Chetna JyotishiBeohar)
8. Kathak ( Indian Classical Dance series) – ( by Shovana Narayan)
9. Abhinaya Darpan ( by- Dr. Puru Dadheech)

# KURUKSHETRA UNIVERSITY

# KURUKSHETRA

## Scheme of Examination and Syllabus
## For Under-Graduate Programme (Multidisciplinary) Scheme - A

## Subject: Music Vocal

**Under (Multiple Entry-Exit, Internship and CBCS-LOCF**
**in accordance to NEP-2020 w.e.f.**
**2023-24 (in phased manner)**

# Scheme of Examination and Syllabus
# For Under-Graduate Programme (Multidisciplinary) Scheme - A

# Subject: Music Vocal
## Under (Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020 w.e.f. 2023-24 (in phased manner)

### First Year Semester-I

| Course | Paper(s) | Nomenclature of paper | Credits | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A1 | B23-BMV-101 | Musicology | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6hrs. | 04 |
| MDC-1 | B23-BMV-102 | Introduction of Indian Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 01 | 05 | 20 | 25 | 6 hrs. | 02 |
| CC-M1 | B23-BMV-103 | General History and Basic Terms of Indian Music | 01 | 10 | 20 | 30 | 3 hrs. | 01 |
| | | Practical | 01 | 05 | 15 | 20 | 6 hrs. | 02 |

## First Year Semester-II

| Course | Paper(s) | Nomenclature of paper | Credits | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A2 | B23-BMV-201 | Historical Study of the Musical Terms | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6 hrs. | 04 |
| MDC-2 | B23-BMV-202 | Theory of Indian Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 01 | 05 | 20 | 25 | 6 hrs. | 02 |
| CC-M2 | B23-BMV-203 | History of Indian Music | 01 | 10 | 20 | 30 | 3 hrs. | 01 |
| | | Practical | 01 | 05 | 15 | 20 | 6 hrs. | 02 |

## Second Year Semester-III

| Course | Paper(s) | Nomenclature of paper | Credit (T) | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A3 | B23-BMV-301 | General Introduction to Musical forms , terms and Techniques | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6 hrs. | 04 |
| MDC-3 | B23-BMV-302 | Hindustani Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 01 | 05 | 20 | 25 | 6 hrs. | 02 |

## Second Year Semester-IV

| Course | Paper(s) | Nomenclature of paper | Credit | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A4 | B23-BMV-401 | Applied Music Theory | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6 hrs. | 04 |

***(Internship of 4 credits of 4-6 weeks duration after 4th semester)***

## Third Year Semester-V

| Course | Paper(s) | Nomenclature of paper | Credit | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A5 | B23-BMV-501 | Life and Contribution of Musicians and Musicologists | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 2 | 15 | 35 | 50 | 6 hrs. | 04 |

## Third Year Semester-VI

| Course | Paper(s) | Nomenclature of paper | Credit | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A6 | B23-BMV-601 (Theory) | Fundamentals of Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6 hrs. | 04 |

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**(Established by the State legislature act of XII 1956)**

**($A^+$ Grade NAAC Accredited)**

**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | |
|---|---|
| **Part A - Introduction** | |
| Subject | Music (vocal) |
| Semester | Ist |
| Name of the Course | Musicology |
| Course Code | B23-BMV- 101 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | N.A. |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. The students will be able to describe the Various Ragas of North Indian classical music.<br>2. The students will be able to describe the various Talas of North Indian classical Music.<br>3. The students will be able to define the terminologies of Indian classical music.<br>4. The students will be able to explain the rich history of Indian music and the contribution of renowned musician. |

| | | | |
|---|---|---|---|
| | 5. The students will be able to perform the various ragas and taalas. | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of seven sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Four long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Unit-I**<br>(a) Historical study and detailed description of the Ragas prescribed in the syllabus.<br>(b)Ability to write the notation of Drut Khayal in the following Ragas:<br>(1) Yaman (2) Bhupali<br>(c) Define the Classical Music . | 8 |
| II | **Unit-II**<br>(c) Ability to write Thekas with dugun in the following Talas: | 8 |

| | | |
|---|---|---|
| | (1) Kehrawa (2) Teentaal.<br>(b) Define the Taal and its importance in Music<br>(c) Detailed study of Khyal Gayan Shaili | |
| III | **Unit-III**<br>(a) Short notes on the followings:<br>Sangeet,Swar,Alankaar,Saptak,Raag,Thaat,Jaati,Vaadi, Samvaadi, Vivadi ,Anuvadi VarjitSwar, Taal, Khayal, Taan, Sthai - Antra.<br>(b) Describe in detail about V.N Bhatkhande's Notation System.<br>(c) Relationship of Folk and Classical Music. | 7 |
| IV | **Unit-IV**<br>(a) History of India Music from Vedic period to 12th Century.<br>(b) Contribution towards Music by the followings:<br>(1) V.N. Bhatkhande (2) V.D. Palustkar<br>(c) Detailed study of the following Instruments.<br>(1) Taanpura (2) Guitar | 7 |
| V* | **Practical**<br>1. Ability to sing any Five basic alankars in Shudh Swaras.<br>2. Ability to Perform Drut Khayal in the following Ragas:<br>(1) Yaman (2) Bhupali<br>3. Ability to Demonstrate the following taalas in Thah and dugun layakaries :<br>(1) Kehrawa (2) Teentaal. | 60 |
| **Suggested Evaluation Methods** | | |

| | |
|---|---|
| **Internal Assessment: 30 (15+15*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.: 15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 15<br>• Mid-Term Exam: | **End Term Examination:**<br>70 ( 35+35*) |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande
2. Kramik Pustak Mallika- Part II V. N. Bhatkhande
3. Sangeet Bodh – Sharad Chandra Pranjpayee
4. Hamare Sangeet Ratna- Laxmi Narayan Garg
5. Raag Parichay Part (1-2) - Harishchand Shrivastav
6. Shastriya Sangeet ka vikas – Dr. Amita Sharma

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**

**(5 Year Integrated Programme)**

**UnderNEP- 2020 W.E.F. 2023-24**

# Format for Designing the Syllabus of a Course

| **Session: 2023-24** | |
|---|---|
| **PartA - Introduction** | |
| Subject | Music (Vocal) |
| Semester | Ist |
| Name of the Course | Introduction of Indian Music |
| Course Code | B23-BMV- 102 |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | MDC |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (ifany) | Na |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Know Different types of Music and Sounds<br>2.Understands the various Basic terms of Music<br>3. Enhance his knowledge about terminology of Taal<br>4. Know about the contribution of great personalities of Indian classical music<br>5*.Develops his/her confidence to perform the given content |

| Credits | Theory | Practical | Total |
|---|---|---|---|
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |

| | |
|---|---|
| **Max. Marks:75 (50+25)**<br>**Internal Assessment Marks:20 (15+5*)**<br>**End Term Exam Marks:55 (35+20*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**PartB-Contentsofthe Course**

**Instructions for Paper- SetterInstructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus,it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.
6. The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **I. Music and Sound**<br>I.I Music and its types – Classical , Semi Classical , Folk Music and Light music.<br>I.2 Sound ,Vibration , Frequeancy.<br>I.3 Naad and its types AahatNaad ,AnhatNaad. | 8 |
| II | **2. Musical terms**<br>2.I Shruti ,swar ,ShuddhaSwar, VikritSwar<br>2.2 Laya and its types Vilambitlaya Madhya layadrutlaya. | 8 |

| | | |
|---|---|---|
| III | **3. Introduction to Taal ,**<br>3.1 Theka ,Avartan , Taali , Khali, Sam ,Vibhag.<br>3.2 Teen Taal , kaharwa , Dadra<br>3.3 Ability to write notation and demonstration on hands with Thah and Dugun . | 7 |
| IV | **4. Biographies**<br>4.1 Contribution of Pt. Vishnu Narayan Bhatkhande in Indian Classical Music<br>4.2Contribution of Pt. Vishnu DigamberPaluskar in Indian Classical Music<br>Knowledge of Ten Thats of Pt. Bhatkhande | 7 |
| V* | 5. **Practical**<br>5.1 Five basic Alankar in shuddhaswaras.<br>5.2 National Antham with instruments.<br>5.3 One SargamGeet in any raga<br>5.4 2 film songs based on five ragas. | 30 |
| **SuggestedEvaluationMethods** | | |
| **InternalAssessment:20 (15+5*)**<br>➢ **Theory 15**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:**15**<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **5**<br>• Mid-Term Exam: | | **End Term Examination:**<br>**55 (35+20*)** |
| **Part C-Learning Resources** | | |

**Recommended Books/e-resources/LMS:**

1. BhatkhandeSangeetShastra- V. N. Bhatkhande
2. KramikPustakMallika- Part II V. N. Bhatkhande
3. Sangeet Bodh – Sharad Chandra Pranjpayee
4. HamareSangeetRatna- Laxmi Narayan Garg
5. Raag Parichay Part (1-2) - HarishchandShrivastav

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**
**(Established by the State legislature act of XII 1956)**
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**Syllabus and Course of Reading for U.G. Programme**
**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **PartA - Introduction** | | | |
| Subject | Music (Vocal) | | |
| Semester | 1st | | |
| Name of the Course | General History and Basic Terms of Indian Music | | |
| Course Code | B23-BMV- 103 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC- Minor | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | N.A | | |
| CourseLearningOutcomes (CLO): | After completing this course, the learner will be able to:<br>1. Elaborate about Indian Classical Music.<br>2. Demonstrate about Terms of Music.<br>3. Demonstrate about the ragas and talas<br>4. Perform the Ragas and Talas | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |

| Contact Hours | 1 | 2 | 3 |
|---|---|---|---|

| | |
|---|---|
| **Max. Marks: 50(30+20)**<br>**Internal Assessment Marks:10+5**<br>**End Term Exam Marks:20+ 15** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of five sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Three long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | 1. Describe about the Development Music<br>2. Brief History of Indian Music Vedic Period to Medieval Period .<br>3. Meaning, Definitions of Music | 4 |
| II | 1. Define the following Terms:<br>2. Naad , Dhwani , Swar , Shruti ,.Saptak<br>3. Define the Taaland itsPrana.<br>4. Detailed study of Raga Yaman Along with DhrutKhyal Notations | 4 |
| III* | 5. Relationship BetweenSwar and Shruti.<br>6. Describe in details about the Teen Taal along with Thah and Dugun. | 4 |

| | | |
|---|---|---|
| | 7. Write in Details About the Notation System. | |
| IV | 8. Importance of Laya and its type.<br>9. Write in details about the following personalities<br>(a)Pt. Vishnu Narayan Bhatkhande (b) Pt. Vishnu DigambarPluskar | 3 |
| V* | **Practical Viva & Stage Performance**<br><br>Ability to demonstrate the Teen TalaTaal on hand :<br><br>Ability to perform the Raga Yaman Along with Two Aalap and Taans .<br><br>Demonstrate the terms of music . | 30 |
| **SuggestedEvaluationMethods** | | |
| **InternalAssessment: 15 (10+5)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | | **End Term Examination:**<br>(20+15) |
| **PartC-Learning Resources** | | |

**Recommended Books/e-resources/LMS:**

Books Recommended

1. BhatkhandeSangeetShastra- V. N. Bhatkhande

2. SangeetVisharad- Basant

3. KramikPustakMallika- Part II V. N. Bhatkhande

4. Sangeet Bodh – Sharad Chandra Pranjpayee

5. HamareSangeetRatna- Laxmi Narayan Garg

6. RaagParichay Part (1-2) - HarishchandShrivastav

7. ShastriyaSangeetkavikas – Dr.Amita Sharma

8. AakashvaniaurSangeet - Prof. Shuchismita Sharma

9. Punjab keLokgeet – Dr. Ashok Sharma

10.Haryana kalokSangeet: Gita Dhankar

11. Also Books Recommended by the teachers.

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**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | |
|---|---|
| **Part A - Introduction** | |
| Subject | Music (vocal) |
| Semester | IInd |
| Name of the Course | Historical Study of the Musical Terms |
| Course Code | B23-BMV- 201 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | N.A. |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. The students will be able to describe the Various Ragas of North Indian classical music .<br>2. The students will be able to describe the various Talas of North Indian classical Music.<br>3. The students will be able to illustrate the historical trends of Indian classical music.<br>4. The students will be able to describe the various theoretical aspects of Indian classical music.<br>5. The students will be able to perform the various |

| | | | |
|---|---|---|---|
| | ragas and talas | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of seven sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Four long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Unit I**<br>(a)Historical study and detailed description of the Ragas prescribed in the syllabus.<br>(b) Ability to Write the notation of any one vilambit Khayal in any of the prescribed ragas.<br>(c) Ability to write the notation of all Drut Khayal in the following Ragas:<br>(1) Vrindavani Sarang (2) Bhairav | 8 |
| II | **Unit II**<br>(a) Ability to write the Thekas with dugun Layakaries in the following Talas: | 8 |

| | | |
|---|---|---|
| | (1) Ek Taal (2) Chautaal<br>(b) Development of Music from Vedic to Modern periods.<br>(c) Importance of table in Vocal as an Accompany Instruments | |
| III | **Unit III**<br>(a) Short notes on the following:<br>Naad,Shruti,Varan,Aavartan,Tarana, Kan,Khatka,Murki,Gamak,Aalap,Lakshan Geet,Laya.<br>(b) Classification of Indian Musical Instruments.<br>(c) Concept of Time Theory in Indian Classical Music. | 7 |
| IV | **Unit IV**<br>(a) Role of Media in the development of Indian Classical Music.<br>(b) Gayakon ke Gun-Dosh.<br>(c) Contribution towards Music by the following Musicians:<br>(1) Pt. Omkarnath Thakur (2) Ustad Abdul Kareem Khan | 7 |
| V* | **Practical**<br>1. Ability to Perform Drut Khayal in the following Ragas:<br>(1) Vrindavani Sarang (2) Bhairav<br>2. Ability to Demonstrate the following taalas in Thah and dugun layakaries :<br>(1) Ek Taal (2) Chautaal | 60 |
| **Suggested Evaluation Methods** | | |

| | |
|---|---|
| **Internal Assessment: 30 (15+15*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.: 15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 15<br>• Mid-Term Exam: | **End Term Examination:**<br>70 ( 35+35*) |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

1 **Books Recommended**

1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande

2.Kramik Pustak Mallika- Part II V. N. Bhatkhande

3. Sangeet Bodh – Sharad Chandra Pranjpayee

4. Hamare Sangeet Ratna- Laxmi Narayan Garg

5. Raag Parichay Part (1-2) - Harishchand Shrivastav

6. Shastriya Sangeet ka vikas – Dr. Amita Sharma

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**

**(5 Year Integrated Programme)**

**UnderNEP- 2020 W.E.F. 2023-24**

# Format for Designing the Syllabus of a Course

| **Session: 2023-24** | |
|---|---|
| **PartA– Introduction** | |
| Subject | Music (Vocal) |
| Semester | IInd |
| Name of the Course | Theory of Indian Music |
| Course Code | B23-BMV- 202 |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | MDC |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (ifany) | Na |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Know Different types of Music and Sounds<br>2.Understands the various Basic terms of Music<br>3. Enhance his knowledge about terminology of Taal<br>4.<br>5*.Develops his/her confidence to perform the given content |

| Credits | Theory | Practical | Total |
|---|---|---|---|
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |

| | |
|---|---|
| **Max. Marks:75 (50+25)**<br>**Internal Assessment Marks:20 (15+5*)**<br>**End Term Exam Marks:55(35+20*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus,it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.
6. The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **I. History of music**<br>I.I Aspects of music ,practical and theory<br>I.2 Saptak and its types , Madhya Mandra and Taarsaptak .<br>I.3 Origin and development of swar | 8 |
| II | **2. Musical Terms**<br>2.1 Raga , Vadi , Samvadi and Vivadiswar, Aroh , Avroh ,pakad ,Samprakartik Raga , Gayan Samay<br>2.2 Varn, Alankar,GramMurcchna | 8 |
| III | **3. Introduction to Taal** | 7 |

| | | |
|---|---|---|
| | 3.1 Ektaal ,RupakTaal ,<br><br>3.2 Ability to write notation and demonstration on hands with Thah and dugun . | |
| IV | **4. Vocal Music Forms**<br><br>4.1 KhyalGayan and its types Vilambit and DrutKhyal , ,<br><br>4.2 Dhrupad ,Dhmar ,<br><br>4.3 Bandish , Tarana, Bhajan , Geet, Ghazal | 7 |
| V* | 5. **Practical**<br>5.1 Five basic Alankar in Vikritswaras.<br>5.2 National song with instruments.<br>5.3 one Gazal or Bhajan with instruments. | 30 |

| **SuggestedEvaluationMethods** | |
|---|---|
| **InternalAssessment:20 (15+5*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:**15**<br>• Mid-Term Exam:<br><br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **5**<br>• Mid-Term Exam: | **End Term Examination: 55(35+20*)** |

**PartC-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. BhatkhandeSangeetShastra- V. N. Bhatkhande
2. KramikPustakMallika- Part II V. N. Bhatkhande
3. Sangeet Bodh – Sharad Chandra Pranjpayee
4. HamareSangeetRatna- Laxmi Narayan Garg
5. Raag Parichay Part (1-2) - HarishchandShrivastav

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**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **PartA - Introduction** | | | |
| Subject | Music (Vocal) | | |
| Semester | IInd | | |
| Name of the Course | History of Indian Music | | |
| Course Code | B23-BMV- 203 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC- Minor | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | N.A | | |
| CourseLearningOutcomes (CLO): | After completing this course, the learner will be able to:<br>1. Elaborate about Indian Classical Music.<br>2. Demonstrate about Terms of Music.<br>3. Demonstrate about the ragas and talas<br>4*. Perform the Ragas and Talas | | |
| Credits | Theory | Practical | Total |

| | | | |
|---|---|---|---|
| | 1 | 1 | 2 |
| Contact Hours | 1 | 2 | 3 |

| | |
|---|---|
| **Max. Marks: 50(30+20)**<br>**Internal Assessment Marks:10+5**<br>**End Term Exam Marks:20+ 15** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of five sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Three long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | 1. A brief history of the Indian music Mugals period to Modern Period .<br>2. Classification of Ragas .<br>3. Complete knowledge of the Ragas and Vilambit and DrutKhyal in each Ragas with Alap and Tans.<br>(a) Bhairav (b) Bilawal | 4 |
| II | 4.Define the following Terms:<br>Raga , That , Jati , Aaroh , Avroh , Sargam , Aalap<br>5. MargSangit and DesiSangit.<br>6. Importance of Ragas in Folk Music. | 4 |
| III | 7. Description and comparative study of the Raga prescribed.<br>8.Describe in details about the EkTaal and Kehrawa along with Thah and Dugun. | 4 |

| | | |
|---|---|---|
| | 9.Write in Details About the KhyalGyanShaili. | |
| IV | 10.Detailed study of the NatyashastraGrantha.<br>11. Relationship between Filmi and Classical Music .<br>12.Write in details about the following personalities (a)PtBhimsen Joshi (b) KishoriAmonkar | 3 |
| V* | **Practical Viva & Stage Performance**<br>• Ability to demonstrate the Taals on hand prescribed in the syllabus<br>• Ability to perform the Ragas Along with Two Aalap and Taan's prescribed in the syllabus .<br>• Demonstrate the terms of music . | 30 |
| **SuggestedEvaluationMethods** | | |
| **InternalAssessment: 15 (10+5)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | | **End Term Examination:**<br>(20+15) |
| **PartC-Learning Resources** | | |

**Recommended Books/e-resources/LMS:**

1. BhatkhandeSangeetShastra- V. N. Bhatkhande
2. SangeetVisharad- Basant
3. KramikPustakMallika- Part II V. N. Bhatkhande
4. Sangeet Bodh – Sharad Chandra Pranjpayee
5. HamareSangeetRatna- Laxmi Narayan Garg
6. RaagParichay Part (1-2) - HarishchandShrivastav
7. ShastriyaSangeetkavikas – Dr.Amita Sharma
8. AakashvaniaurSangeet - Prof. Shuchismita Sharma
9. Punjab keLokgeet – Dr. Ashok Sharma
10. Haryana kalokSangeet: Gita Dhankar
11. Also Books Recommended by the teachers.

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**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | |
|---|---|
| **Part A - Introduction** | |
| Subject | Music (vocal) |
| Semester | IIIrd |
| Name of the Course | General Introduction to Musical Forms ,Terms and Techniques |
| Course Code | B23-BMV- 301 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC |
| Level of the course (As per Annexure-I | 200-299 |
| Pre-requisite for the course (if any) | N.A. |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. The students will be able to describe the Various Ragas of North Indian classical music .<br>2. The students will be able to describe the various Talas of North Indian classical Music.<br>3. The students will be able to define the terminologies of Indian classical music.<br>4. The students will be able to explain the rich history of Indian music and contribution renowned musician. |

| | | | |
|---|---|---|---|
| | 5. The students will be able to perform the various ragas and taalas | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of seven sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Four long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Ragas :**<br>(a)Historical study and detailed description of the Ragas prescribed in the syllabus.<br>(b)Ability to write the notation of any one vilambit Khayal in the prescribed Ragas.<br>(c)Ability to write the notation of each Drut Khayal in the following Ragas:<br>(1) Shudh Sarang (2) Malkauns (3) Bhimplashi | 8 |
| II | **Taal :**<br>(a) Ability to write Thekas with dugun and chaugun in the following Talas: | 8 |

| | | |
|---|---|---|
| | (1) Jhaptaal (2) Ada Chautaal.<br>(b)mportance of Taal in Khyal Gayan Shaili<br>(c) Taal ke Das Pran | |
| III | **Musical Terms :**<br>(a) Definition of the followings:<br>Thumri, Tappa, Avirbhaav, Tirobhaav,Aalap, Gram, Murchna,Vagyakaar, Alpatav - Bahutv, Aandolan<br>(b) Difference between Margi-Desi Sangeet.<br>(c) Describe in detail about Raag Vargikaran. | 7 |
| IV | **Essays and Biographies**<br>(a) Role of Music in national Integration.<br>(b) Different Gharana's of Khayal Gayan.<br>(c) Contribution towards Music by the followings:<br>(1) Miyan Tansen (2) Ustad Bade Gulam Ali Khan | 7 |
| V* | **Practical**<br>1. Ability to sing any Ten alankars in Shudh Swaras.<br>2. Ability to Perform Drut Khayal in the following Ragas:<br>(1) Shudh Sarang (2) Malkauns (3) Bhimplashi<br>3. Ability to Demonstrate the following taalas in Thah and dugun layakaries :<br>(1) Jhaptaal (2) Ada Chautaal. | 60 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment: 30 (15+15*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.: 15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 15<br>• Mid-Term Exam: | | **End Term Examination:**<br>70 ( 35+35*) |
| **Part C-Learning Resources** | | |

**Recommended Books/e-resources/LMS:**

1. **Books Recommended**

1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande
2. Kramik Pustak Mallika- Part II V. N. Bhatkhande
3. Sangeet Bodh – Sharad Chandra Pranjpayee
4. Hamare Sangeet Ratna- Laxmi Narayan Garg
5. Raag Parichay Part (1-2) - Harishchand Shrivastav
6. Shastriya Sangeet ka vikas – Dr. Amita Sharma

*Applicable for courses having practical component.

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**

**(5 Year Integrated Programme)**

**UnderNEP- 2020 W.E.F. 2023-24**

# Format for Designing the Syllabus of a Course

| **Session: 2023-24** | |
|---|---|
| **PartA - Introduction** | |
| Subject | Music (Vocal) |
| Semester | IIIrd |
| Name of the Course | Hindustani Music |
| Course Code | B23-BMV- 302 |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | MDC |
| Level of the course (As per Annexure-I | 200-299 |
| Pre-requisite for the course (ifany) | NA |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Know Different types of Music and Sounds.<br>2.Understands the various Basic terms of Music.<br>3. Enhance his knowledge about terminology of Taal.<br>4. Knowledge of traditional teaching and contribution of legendary musicians.<br>5*.Develops his/her confidence to perform the given content |

| Credits | Theory | Practical | Total |
|---|---|---|---|
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |

| | |
|---|---|
| **Max. Marks: 75 (50+25)**<br>**Internal Assessment Marks:20 (15+5*)**<br>**End Term Exam Marks:55 (35+20*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**PartB-Contentsofthe Course**

**<u>Instructions for Paper- Setter</u>**

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **1.History of music**<br>1.1 Development of Indian classical music in modern period.<br>1.2 Music in following treatise- NatyaShastra, SangitRatnakar | 8 |
| II | **2. Musical Terms**<br>2.1 Classification of Indian Instruments.<br>2.2 Classification of Ragas.<br>2.3 Concept of Time theory in Indian Classical Music.<br>2.4. Jaties of Rags. | 8 |
| III | **3.Introduction to Taal**<br>3.1 Knowledge of following Ragas-Yaman,Bhupali.<br>3.2 Ability to write following Taalas with Thah and dugunLaykaries. | 7 |
| IV | **4. Vocal Music Forms** | 7 |

| | | |
|---|---|---|
| | 4.1 Gharana tradition in Indian Classical Music.<br><br>4.2 Gharan of KhyalGayaki.<br><br>4.3 Contribution of Following musician in Indian Classical Music- Pt. Vishnu DigambarPalushkar, Pt. Vishnu Narayan Bhatkhande. | |
| V* | **5. Practical**<br>5.1 Ability to perform DrutKhyal in following Ragas- Yaman, Bhupali<br>5.2 One SargamGeet in any Raga.<br>5.3 One Gazal or Bhajan with instruments. | 30 |
| **SuggestedEvaluationMethods** | | |
| **InternalAssessment:20 (15+5*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:**15**<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **5**<br>• Mid-Term Exam: | | **End Term Examination:**<br>**55 (35+20)** |
| **PartC-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>1. BhatkhandeSangeetShastra- V. N. Bhatkhande<br>2.KramikPustakMallika- Part II V. N. Bhatkhande<br>3.Sangeet Bodh – Sharad Chandra Pranjpayee<br>4. HamareSangeetRatna- Laxmi Narayan Garg<br>5. Raag Parichay Part (1-2) - HarishchandShrivastav | | |

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**(Established by the State legislature act of XII 1956)**

**($A^+$ Grade NAAC Accredited )**

**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | |
|---|---|
| **Part A - Introduction** | |
| Subject | Music (vocal) |
| Semester | IVth |
| Name of the Course | Applied Music Theory |
| Course Code | B23-BMV- 401 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC |
| Level of the course (As per Annexure-I | 200-299 |
| Pre-requisite for the course (if any) | N.A. |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. The students will be able to describe the Various Ragas of North Indian classical music .<br>2. The students will be able to describe the various Talas of North Indian classical Music.<br>3. The students will be able to illustrate the historical trends of Indian classical music.<br>4. The students will be able to describe the various theoretical aspects of Indian classical music.<br>5. *The students will be able to perform the various |

| | | | |
|---|---|---|---|
| | ragas and talas<br>. | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of seven sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Four long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Ragas**<br>(a) Historical study and detailed description of the Ragas prescribed in the syllabus.<br>(b) Ability to write the notation of any one Vilambit Khayal in the prescribed Ragas.<br>(c) Ability to write the notation of all Drut Khayals in the following Ragas:<br>(1) Bhairavi (2) Kedar (3) Asawari | 8 |
| II | **Taal**<br>(a) Ability to write the Thekas with dugun and Chaugan Layakaries in the following Talas: | 8 |

| | | |
|---|---|---|
| | (1) Tivra (2) Sooltaal<br>(b) Importance of Laya in Classical Music .<br>(c) Detailed Study of Types of Instruments. | |
| III | **Musical terms**<br>(a) Definitions of the following:<br>Geet, Bhajan,Shabad, Folk Song, Filmi Geet,kajri, Chaiti, bhatiali<br>(b) Write in detail about Sahayak Naad (Syambhu Swar).<br>(c) Merits and Demerits of Notation System. | 7 |
| IV | **History and Biographies**<br>(a) Detail study of the following ancient text.<br>(1) Natya Shastra (2) Sangeet Ratnakar.<br>(b) History of music in Medieval Period.<br>(c) Contribution towards Music by the following Musicians:<br>(1) Pt. Bhimsain Joshi (2) Pt. Jasraaj | 7 |
| V* | **Practical**<br>1. Ability to Perform One Vilambit khyal in any one raga and and Drut Khayal in each of the following Ragas:<br>(1) Bhairavi (2) Kedar (3) Asawari<br>2. Ability to Demonstrate the following taalas in Thah and dugun layakaries :<br>(1) Tivra (2) Sooltaal | 60 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:30 (15+15*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:15<br>• Mid-Term Exam: | | **End Term Examination:**<br>70 ( 35+35*) |

| Part C-Learning Resources |
| --- |
| **Recommended Books/e-resources/LMS:**<br><br>1 **Books Recommended**<br>1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande<br>2. Kramik Pustak Mallika- Part II V. N. Bhatkhande<br>3. Sangeet Bodh – Sharad Chandra Pranjpayee<br>4. Hamare Sangeet Ratna- Laxmi Narayan Garg<br>5. Raag Parichay Part (1-2) - Harishchand Shrivastav<br>6. Shastriya Sangeet ka vikas – Dr. Amita Sharma |

# KURUKSHETRA UNIVERSITY

# KURUKSHETRA

## Scheme of Examination and Syllabus
## For Under-Graduate Programme (Multidisciplinary) Scheme-A

## Subject: Music Instrumental (Sitar)

**Under (Multiple Entry-Exit, Internship and CBCS-LOCF**
**in accordance to NEP-2020 w.e.f.**
**2023-24 (in phased manner)**

# Scheme of Examination and Syllabus
# For Under-Graduate Programme (Multidisciplinary) Scheme-A

# Subject: Music Instrumental (Sitar)
## Under (Multiple Entry-Exit, Internship and CBCS-LOCF
## in accordance to NEP-2020 w.e.f.
## 2023-24 (in phased manner)

**Semester-I**

| Course | Paper(s) | Nomenclature of paper | Credits | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A1 | B23-BMI-101 | Fundamentals of North Indian Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6 hrs. | 04 |
| MDC-1 | B23-BMI-102 | Terminology of Indian Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 01 | 05 | 20 | 25 | 6 hrs. | 02 |
| CC-M1 | B23-BMI-103 | History of Instrumental Music | 01 | 10 | 20 | 30 | 3 hrs. | 01 |
| | | Practical | 01 | 05 | 15 | 20 | 6 hrs. | 02 |

## Semester-II

| Course | Paper(s) | Nomenclature of paper | Credits | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A2 | B23-BMI-201 | History of Non-Percussion Instruments and Ragas | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6 hrs. | 04 |
| MDC-2 | B23-BMI-202 | Basics Terms of Indian Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 01 | 05 | 20 | 25 | 6 hrs. | 02 |
| CC-M2 | B23-BMI-203 | Raga and Taal in Indian Music | 01 | 10 | 20 | 30 | 3 hrs. | 01 |
| | | Practical | 01 | 05 | 15 | 20 | 6 hrs. | 02 |

## Semester-III

| Course | Paper(s) | Nomenclature of paper | Credits | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A3 | B23-BMI-301 | Ragas, Forms and Terms of Indian Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6 hrs. | 04 |
| MDC-3 | B23-BMI-302 | Forms of Vocal and Instrumental Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 01 | 05 | 20 | 25 | 6 hrs. | 02 |

## Second Year Semester-IV

| Course | Paper(s) | Nomenclature of paper | Credit (T) | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/ week |
|---|---|---|---|---|---|---|---|---|
| CC-A4 | B23-BMI-401 | Life Sketch ,Ragas and Taal of Indian Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6 hrs. | 04 |

***(Internship of 4 credits of 4-6 weeks duration after 4th semester)***

## Third Year Semester-V

| Course | Paper(s) | Nomenclature of paper | Credits | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/week |
|---|---|---|---|---|---|---|---|---|
| CC-A5 | B23-BMI-501 | Instrumental Music of north India | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 2 | 15 | 35 | 50 | 6 hrs. | 04 |

## Third Year Semester-VI

| Course | Paper(s) | Nomenclature of paper | Credits | Internal Marks | External Marks | Total Marks | Exam duration | Contact Hours/week |
|---|---|---|---|---|---|---|---|---|
| CC-A6 | B23-BMI-601 | Basic Principals of Indian Classical Music | 02 | 15 | 35 | 50 | 3 hrs. | 02 |
| | | Practical | 02 | 15 | 35 | 50 | 6 hrs. | 04 |

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**
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**Syllabus and Course of Reading for U.G. Programme**
**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | |
|---|---|
| **Part A - Introduction** | |
| Subject | Music Instrumental (Sitar) |
| Semester | Ist |
| Name of the Course | Fundamentals of North Indian Music |
| Course Code | B23-BMI- 101 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | N.A. |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. The students will be able to describe the Various Ragas of North Indian classical music .<br>2. The students will be able to describe the various Talas of North Indian classical Music.<br>3. The students will be able to define the terminologies of Indian classical music.<br>4. The students will be able to explain the rich |

| | | | |
|---|---|---|---|
| | history of Indian music and contribution renowned musician.<br>5. Perform various ragas and taalas | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) | |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of seven sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Four long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Unit 1**<br>1. Historical study and detailed description of the Ragas prescribed in the syllabus.<br>2.Ability to write the notation of Raza Khani gats in the following Ragas:<br>(1) Yaman (2) Bhupali<br>3. Origion and development of Sitar | 8 |
| II | **Unit II**<br>4. Importance of String instruments in music<br>5. Ability to write Thekas with dugun in the following Talas: | 8 |

| | | |
|---|---|---|
| | (1) Teentaal (2) Kehrawa<br>6. Sturctuter of sitar with Diagram | |
| III | **Unit III**<br>7.Short notes on the followings:<br>Sangeet,Swar,Alankaar,Saptak,Raag,Thaat,Jaati, Vaadi Samvaadi Vivadi Anuvadi VarjitSwar , Taal, Gat,Tora,Sthai - Antra.<br>8.Describe in detail about V.N Bhatkhande's Notation System.<br>9. Relationship between Sitar and Veena . | 7 |
| IV | **Unit - IV**<br>10. History of India Music from Vedic period to 12th Century.<br>11. Contribution towards Music by the followings:<br>(1) V.N. Bhatkhande (2) V.D. Palustkar<br>12.Detailed study of the following Instruments.<br>(1) Sitar (2) Guitar | 7 |
| V* | **Practical**<br>1. Ability to play any Five basic Toda in Shudh Swaras.<br>2. Ability to Perform Gat in the following Ragas:<br>(1) Yaman (2) Bhupali<br>3. Ability to Demonstrate the following taalas in Thah and dugun layakaries :<br>(1) Kehrawa (2) Teentaal. | 60 |
| **Suggested Evaluation Methods** | | |

| | |
|---|---|
| **Internal Assessment: 30 (15+15*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.: 15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 15<br>• Mid-Term Exam: | **End Term Examination:**<br>70 ( 35+35*) |
| **Part C-Learning Resources** | |
| **Recommended Books/e-resources/LMS:**<br><br>1. **Books Recommended**<br>1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande<br>2.Kramik Pustak Mallika- Part II V. N. Bhatkhande<br>3. Sangeet Bodh – Sharad Chandra Pranjpayee<br>4. Hamare Sangeet Ratna- Laxmi Narayan Garg<br>5. Raag Parichay Part (1-2) - Harishchand Shrivastav<br>6. Shastriya Sangeet ka vikas – Dr. Amita Sharma | |

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**

**(5 Year Integrated Programme)**

**Under NEP- 2020 W.E.F. 2023-24**

**Format for Designing the Syllabus of a Course**

| **Session: 2023-24** | |
|---|---|
| **PartA - Introduction** | |
| Subject | Music Instrumental (Sitar) |
| Semester | Ist |
| Name of the Course | Terminology of Indian Music |
| Course Code | B23-BMI 102 |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | MDC |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (ifany) | Na |

| | | | |
|---|---|---|---|
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Know Different types of Music and Sounds<br>2.Understands the various Basic terms of Music<br>3. Enhance his knowledge about terminology of Taal<br>4. Know about the contribution of great personalities of Indian classical music<br>5*.Develops his/her confidence to perform the given content | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |
| **Max. Marks: 75 (50+25)**<br>**Internal Assessment Marks:20 (15+5*)**<br>**End Term Exam Marks:55 (35+20*)** | | **Time:** 3 Hours (Theory) / 6 hrs. (Practical) | |

**PartB-Contentsofthe Course**

**Instructions for Paper- SetterInstructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus, it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.
6. The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|

| | | |
|---|---|---|
| I | **I. Music and Sound**<br>I.I Music and its types – Classical , Semi Classical , Folk Music and Light music.<br>I.2 Sound ,Vibration , Frequeancy.<br>I.3 Naad and its types AahatNaad ,AnhatNaad. | 8 |
| II | **2. Musical terms**<br>2.I Shruti ,swar ,ShuddhaSwar, VikritSwar<br>2.2 Laya and its types Vilambitlaya Madhya layadrutlaya. | 8 |
| III | **3. Introduction to Taal ,**<br>3.1 Theka ,Avartan , Taali , Khali, Sam ,Vibhag.<br>3.2 Teen Taal , kaharwa , Dadra<br>3.3 Ability to write notation and demonstration on hands with Thah and Dugun . | 7 |
| IV | **4. Biographies**<br>4.1 Contribution of Pt. Vishnu Narayan Bhatkhande in Indian Classical Music<br>4.2Contribution of Pt. Vishnu DigamberPaluskar in Indian Classical Music<br>Knowledge of Ten Thats of Pt. Bhatkhande | 7 |
| V* | 5. **Practical**<br>5.1 Five basic Alankar in shuddhaswaras. | 30 |

| | | |
|---|---|---|
| | 5.2 National Antham with instruments.<br>5.3 One SargamGeet in any raga<br>5.4 2 film songs based on five ragas. | |
| **SuggestedEvaluationMethods** | | |
| **InternalAssessment:20 (15+5*)**<br>➢ **Theory 15**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:**15**<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **5**<br>• Mid-Term Exam: | | **End Term Examination: 55 (35+20*)** |
| **PartC-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>1. BhatkhandeSangeetShastra- V. N. Bhatkhande<br>2. KramikPustakMallika- Part II V. N. Bhatkhande<br>3. Sangeet Bodh – Sharad Chandra Pranjpayee<br>4. HamareSangeetRatna- Laxmi Narayan Garg<br>5. RaagParichay Part (1-2) - HarishchandShrivastav | | |

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

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**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | |
|---|---|
| **PartA - Introduction** | |
| Subject | Music Instrumental (Sitar) |
| Semester | 1st |
| Name of the Course | History of Instrumental Music |
| Course Code | B23-BMI- 103 |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC- Minor |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (ifany) | N.A |

| | | | |
|---|---|---|---|
| CourseLearningOutcomes (CLO): | After completing this course, the learner will be able to:<br>1. Elaborate about Indian Classical Music.<br>2. Demonstrate about Terms of Music.<br>3.Demonstrate about the ragas and talas<br>4. Enhance his/her knowledge about Contribution of various musicians<br>5*. Perform the Ragas and Talas | | |
| Credits | Theory | Practical | Total |
| | 1 | 1 | 2 |
| Contact Hours | 1 | 2 | 3 |
| **Max. Marks: 50(30+20)**<br>**Internal Assessment Marks:10+5**<br>**End Term Exam Marks:20+ 15** | | **Time:** 3 Hours (Theory) / 6 hrs. (Practical) | |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of five sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Three long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | 1. Describe about the Development Music<br>2. Brief History of Indian Music Vedic Period to Medieval Period .<br>3. Meaning, Definitions of Music | 4 |

| | | |
|---|---|---|
| | | |
| II | 1. Define the following Terms:<br>2. Naad , Dhwani , Swar , Shruti ,.Saptak<br>3. Define the Taaland itsPrana.<br>4. Detailed study of Raga Yaman Along with DhrutKhyal Notations | 4 |
| III* | 5. Relationship BetweenSwar and Shruti.<br>6. Describe in details about the Teen Taal along with Thah and Dugun.<br>7. Write in Details About the Notation System. | 4 |
| IV | 8. Importance of Laya and its type.<br>9. Write in details about the following personalities (a)Pt. Vishnu Narayan Bhatkhande (b) Pt. Vishnu DigambarPluskar | 3 |
| V* | **Practical Viva & Stage Performance**<br>Ability to demonstrate the Teen TalaTaal on hand :<br>Ability to perform the Raga Yaman Along with Two Aalap and Taans .<br>Demonstrate the terms of music . | 30 |
| **SuggestedEvaluationMethods** | | |

| InternalAssessment: 15 (10+5) | End Term Examination: (20+15) |
|---|---|
| ➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | |

**PartC-Learning Resources**

**Recommended Books/e-resources/LMS:**

Books Recommended

1. BhatkhandeSangeetShastra- V. N. Bhatkhande
2. SangeetVisharad- Basant
3. KramikPustakMallika- Part II V. N. Bhatkhande
4. Sangeet Bodh – Sharad Chandra Pranjpayee
5. HamareSangeetRatna- Laxmi Narayan Garg
6. RaagParichay Part (1-2) - HarishchandShrivastav
7. ShastriyaSangeetkavikas – Dr.Amita Sharma
8. AakashvaniaurSangeet - Prof. Shuchismita Sharma
9. Punjab keLokgeet – Dr. Ashok Sharma
10. Haryana kalokSangeet: Gita Dhankar
11. Also Books Recommended by the teachers.

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

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**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | |
|---|---|
| **Part A - Introduction** | |
| Subject | Music Instrumental (Sitar) |
| Semester | IInd |
| Name of the Course | History of Non-Percussion Instruments and Ragas |
| Course Code | B23-BMI- 201 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | N.A. |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. The students will be able to describe the Various Ragas of North Indian classical music .<br>2. The students will be able to describe the various Talas of North Indian classical Music.<br>3. The students will be able to illustrate the historical trends of Indian classical music.<br>4. The students will be able to describe the various |

| | | | |
|---|---|---|---|
| | theoretical aspects of Indian classical music.<br>5. The students will be able to present given ragas and taalas | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) | |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of seven sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Four long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Unit - I**<br>(a) Historical study and detailed description of the Ragas prescribed in the syllabus.<br>(b) Ability to write the notation of Any one Maseetkhani Gat in any Ragas prescribed in syllabus.<br>(c) Ability to write the notation of Raza Khani Gats in the following Ragas:<br>(1) Vrindavani Sarang (3) Bhairav | 8 |
| II | **Unit - II**<br>(a) Ability to write the Thekas with dugun Layakaries in the | 8 |

| | | |
|---|---|---|
| | following Talas:<br>(1) Ek Taal (2) Chautaal<br>(b) Development of Music from Vedic to Modern period<br>(c) Importance of table in Vocal as an Accompany Instruments | |
| III | **Unit - III**<br>(a) Short notes on the following:<br>Naad,Shruti,Varan,Aavartan,Jhala,Soot,Meend,Ghaseet,Jamjama, Kan, Khatka, Murki,Krintan,Gamak, Laya.<br>(b) Classification of Indian Musical Instruments.<br>(c) Concept of Time Theory in Indian Classical Music. | 7 |
| IV | **Unit - IV**<br>(a) Role of Media in the development of Indian Classical Music.<br>(b) Sitar Vadakon ke Gun-Dosh.<br>(c) Contribution towards Music by the following Musicians:<br>(1) Pt. Ravi Shankar (2) Ustad Vilayat Khan | 7 |
| V* | **Practical**<br>1. Ability to Perform Gats in the following Ragas:<br>(1) Vrindavani Sarang (2) Bhairav<br>2. Ability to Demonstrate the following taalas in Thah and dugun layakaries :<br>(1) Ek Taal (2) Chautaal | 60 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:30 (15+15*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:15<br>• Mid-Term Exam: | | **End Term Examination:**<br>70 ( 35+35*) |
| **Part C-Learning Resources** | | |

**Recommended Books/e-resources/LMS:**

1 **Books Recommended**

1Bhatkhande Sangeet Shastra- V. N. Bhatkhande

2.Kramik Pustak Mallika- Part II V. N. Bhatkhande

3. Sangeet Bodh – Sharad Chandra Pranjpayee

4. Hamare Sangeet Ratna- Laxmi Narayan Garg

5. Raag Parichay Part (1-2) - Harishchand Shrivastav

6. Shastriya Sangeet ka vikas – Dr. Amita Sharma

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**

**(5 Year Integrated Programme)**

**Under NEP- 2020 W.E.F. 2023-24**

# Format for Designing the Syllabus of a Course

| **Session: 2023-24** | | | |
|---|---|---|---|
| **PartA – Introduction** | | | |
| Subject | Music Instrumental (Sitar) | | |
| Semester | IInd | | |
| Name of the Course | Basics Terms of Indian Music | | |
| Course Code | B23-BMI- 202 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | MDC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | Na | | |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Know Different types of Music and Sounds<br>2.Understands the various Basic terms of Music<br>3. Enhance his knowledge about terminology of Taal<br>4. Enhance his knowledge about various musical Forms<br>5*.Develops his/her confidence to perform the given content | | |
| Credits | Theory | Practical | Total |

| | | | |
|---|---|---|---|
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |

| | |
|---|---|
| **Max. Marks: 75 (50+25)**<br>**Internal Assessment Marks: 20 (15+5*)**<br>**End Term Exam Marks:55 (35+20*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus, it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.
6. The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **I. History of music**<br>I.I Aspects of music ,practical and theory<br>I.2 Saptak and its types , Madhya Mandra and Taarsaptak .<br>I.3 Origin and development of swar | 8 |
| II | **2. Musical Terms**<br>2.1 Raga , Vadi , Samvadi and Vivadiswar, Aroh , Avroh ,pakad ,Samprakartik Raga , GayanSamay<br>2.2 Varn, Alankar,GramMurcchna | 8 |
| III | **3. Introduction to Taal**<br>3.1 Ektaal ,RupakTaal ,<br>3.2 Ability to write notation and demonstration on hands with Thah and dugun . | 7 |

| | | |
|---|---|---|
| IV | **4. Vocal Music Forms**<br>4.1 KhyalGayan and its types Vilambit and DrutKhyal , ,<br>4.2 Dhrupad ,Dhmar ,<br>4.3 Bandish , Tarana, Bhajan , Geet, Ghazal | 7 |
| V* | 5. **Practical**<br>5.1 Five basic Alankar in Vikritswaras.<br>5.2 National song with instruments.<br>5.3 oneGazal or Bhajan with instruments. | 30 |
| **SuggestedEvaluationMethods** | | |
| **InternalAssessment:20 (15+5*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:**15**<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **5**<br>• Mid-Term Exam: | | **End Term Examination:**<br>**55(35+20*)** |
| **PartC-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>1. BhatkhandeSangeetShastra- V. N. Bhatkhande<br>2. KramikPustakMallika- Part II V. N. Bhatkhande<br>3. Sangeet Bodh – Sharad Chandra Pranjpayee<br>4. HamareSangeetRatna- Laxmi Narayan Garg<br>5. RaagParichay Part (1-2) - HarishchandShrivastav | | |

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**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **PartA - Introduction** | | | |
| Subject | Music (Vocal) | | |
| Semester | IInd | | |
| Name of the Course | Raga and Taal in Indian Music | | |
| Course Code | B23-BMI- 203 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC- Minor | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | N.A | | |
| CourseLearningOutcomes (CLO): | After completing this course, the learner will be able to:<br>1. Elaborate about Indian Classical Music.<br>2. Demonstrate about Terms of Music.<br>3. Demonstrate about the ragas and talas<br>4. Differentiate between Film and classical music<br>5* Perform the Ragas and Talas | | |
| Credits | Theory | Practical | Total |

| | | | |
|---|---|---|---|
| | 1 | 1 | 2 |
| Contact Hours | 1 | 2 | 3 |

| | |
|---|---|
| **Max. Marks: 50(30+20)**<br>**Internal Assessment Marks:10+5**<br>**End Term Exam Marks:20+ 15** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of five sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Three long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | 1. A brief history of the Indian music Mugals period to Modern Period .<br>2. Classification of Ragas .<br>3. Complete knowledge of the Ragas and Vilambit and DrutKhyal in each Ragas with Alap and Tans.<br>(a) Bhairav (b) Bilawal | 4 |
| II | 4.Define the following Terms:<br>Raga , That , Jati , Aaroh , Avroh , Sargam , Aalap<br>5. MargSangit and DesiSangit.<br>6. Importance of Ragas in Folk Music. | 4 |
| III | 7. Description and comparative study of the Raga prescribed.<br>8.Describe in details about the EkTaal and Kehrawa along with Thah and Dugun.<br>9.Write in Details About the KhyalGyanShaili. | 4 |
| IV | 10.Detailed study of the Natyashastra Grantha.<br>11. Relationship between Filmi and Classical Music .<br>12.Write in details about the following personalities (a)PtBhimsen | 3 |

| | | |
|---|---|---|
| | Joshi (b) KishoriAmonkar | |
| V* | **Practical Viva & Stage Performance**<br>• Ability to demonstrate the Taals on hand prescribed in the syllabus<br>• Ability to perform the Ragas Along with Two Aalap and Taan's prescribed in the syllabus .<br>• Demonstrate the terms of music . | 30 |

| **SuggestedEvaluationMethods** | |
|---|---|
| **InternalAssessment: 15 (10+5)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | **End Term Examination:**<br>(20+15) |

**PartC-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. BhatkhandeSangeetShastra- V. N. Bhatkhande
2. SangeetVisharad- Basant
3. KramikPustakMallika- Part II V. N. Bhatkhande
4. Sangeet Bodh – Sharad Chandra Pranjpayee
5. HamareSangeetRatna- Laxmi Narayan Garg
6. RaagParichay Part (1-2) - HarishchandShrivastav
7. ShastriyaSangeetkavikas – Dr.Amita Sharma
8. AakashvaniaurSangeet - Prof. Shuchismita Sharma
9. Punjab keLokgeet – Dr. Ashok Sharma

10.Haryana kalokSangeet: Gita Dhankar

11. Also Books Recommended by the teachers.

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**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | |
|---|---|
| **Part A - Introduction** | |
| Subject | Music (Sitar) |
| Semester | IIIrd |
| Name of the Course | Ragas, Forms and Terms of Indian Music |
| Course Code | B23-BMI- 301 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC |
| Level of the course (As per Annexure-I | 200-299 |
| Pre-requisite for the course (if any) | N.A. |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. The students will be able to describe the Various Ragas of North Indian classical music .<br>2. The students will be able to describe the various Talas of North Indian classical Music.<br>3. The students will be able to define the terminologies of Indian classical music.<br>4. The students will be able to explain the rich history of Indian music and contribution renowned musician.<br>a. 5* The student will be able to perform |

| | | | |
|---|---|---|---|
| | given ragas and taalas | | |
| Credits | Theory | Practical | Total |
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of seven sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Four long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Ragas**<br>(a) Historical study and detailed description of the Ragas prescribed in the syllabus.<br>(b) Ability to write the notation of any one Maseetkhani Gat in the prescribed Ragas.<br>(c) Ability to write the notation of each Razakhani Gat in the following Ragas:<br>(1) Shudh Sarang (2) Malkauns (3) Bhimplashi | 8 |
| II | **Taal**<br>(a) Ability to write Thekas with dugun and chaugun in the following Talas:<br>(1) Jhaptaal (2) Ada Chautaal.<br>(b) Importance of Taal in Gats | 8 |

| | | |
|---|---|---|
| | (c) Taal ke Das Pran | |
| III | **Musical Terms**<br>(a) Definition of the followings:<br>Thumri, Tappa, Avirbhaav - Tirobhaav, Aalap, Gram, Murchna, Vagyakaar, Alpatav-Bahutv, Aakarsh, Apkarsh - Prahaar, Sitar ke bol,Aandolan<br>(b) Difference between Margi-Deshi Sangeet.<br>(c) Describe in detail about Raag Vargikaran. | 7 |
| IV | **Essays and Biographies**<br>(a) Role of Music in national Integration.<br>(b) Different Gharana's of Sitar Vadan.<br>(c) Contribution towards Music by the followings:<br>(1) Pt. Pannalal Ghosh (2) Pt. Buddhaditya Mukherjee | 7 |
| V* | **Practical**<br>1. Ability to sing any Ten alankars in Shudh Swaras.<br>2. Ability to Perform Drut Khayal in the following Ragas:<br>(1) Shudh Sarang (2) Malkauns (3) Jaijaiwanti<br>3. Ability to Demonstrate the following taalas in Thah and dugun layakaries :<br>(1) Jhaptaal (2) Ada Chautaal. | 60 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment: 30 (15+15*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.: 15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 15<br>• Mid-Term Exam: | | **End Term Examination:**<br>70 ( 35+35*) |
| **Part C-Learning Resources** | | |

**Recommended Books/e-resources/LMS:**

1. **Books Recommended**

1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande
2.Kramik Pustak Mallika- Part II V. N. Bhatkhande
3. Sangeet Bodh – Sharad Chandra Pranjpayee
4. Hamare Sangeet Ratna- Laxmi Narayan Garg
5. Raag Parichay Part (1-2) - Harishchand Shrivastav
6. Shastriya Sangeet ka vikas – Dr. Amita Sharma

**KURUKSHERTRA UNIVERSITY KURUKSHETRA**

**Syllabus and Course of Reading for Master of Performing Arts**

**(5 Year Integrated Programme)**

**Under NEP- 2020 W.E.F. 2023-24**

# Format for Designing the Syllabus of a Course

| **Session: 2023-24** | |
|---|---|
| **PartA - Introduction** | |
| Subject | Music (Sitar) |
| Semester | IIIrd |
| Name of the Course | Forms of Vocal and Instrumental Music |
| Course Code | B23-BMI- 302 |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | MDC |
| Level of the course (As per Annexure-I | 200-299 |
| Pre-requisite for the course (ifany) | NA |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Know Different types of Music and Sounds.<br>2.Understands the various Basic terms of Music.<br>3. Enhance his knowledge about terminology of Taal.<br>4. Knowledge of traditional teaching and contribution of legendary musicians.<br>5*.Develops his/her confidence to perform the given content |

| Credits | Theory | Practical | Total |
|---|---|---|---|
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |

| | |
|---|---|
| **Max. Marks: 75 (50+25)**<br>**Internal Assessment Marks:20 (15+5*)**<br>**End Term Exam Marks:55 (35+20*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **1.History of music**<br>1.1 Development of Indian classical music in modern period.<br>1.2 Music in following treatise- NatyaShastra, SangitRatnakar | 8 |
| II | **2. Musical Terms**<br>2.1 Classification of Indian Instruments.<br>2.2 Classification of Ragas.<br>2.3 Concept of Time theory in Indian Classical Music.<br>2.4. Jaties of Rags. | 8 |
| III | **3.Introduction to Taal**<br>3.1 Knowledge of following Ragas-Yaman,Bhupali.<br>3.2 Ability to write following Taalas with Thah and dugunLaykaries. | 7 |
| IV | **4. Vocal Music Forms**<br>4.1 Gharana tradition in Indian Classical Music. | 7 |

| | | |
|---|---|---|
| | 4.2 Gharan of KhyalGayaki.<br><br>4.3 Contribution of Following musician in Indian Classical Music- Pt. Vishnu DigambarPalushkar, Pt. Vishnu Narayan Bhatkhande. | |
| V* | **5. Practical**<br>5.1 Ability to perform DrutKhyal in following Ragas- Yaman, Bhupali<br>5.2 One SargamGeet in any Raga.<br>5.3 One Gazal or Bhajan with instruments. | 30 |
| **SuggestedEvaluationMethods** | | |
| **InternalAssessment:20 (15+5*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:**15**<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: **5**<br>• Mid-Term Exam: | | **End Term Examination:**<br>**55 (35+20)** |
| **PartC-Learning Resources** | | |
| **Recommended Books/e-resources/LMS:**<br>1. BhatkhandeSangeetShastra- V. N. Bhatkhande<br>2. KramikPustakMallika- Part II V. N. Bhatkhande<br>3. Sangeet Bodh – Sharad Chandra Pranjpayee<br>4. HamareSangeetRatna- Laxmi Narayan Garg<br>5. RaagParichay Part (1-2) - HarishchandShrivastav | | |

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**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | |
|---|---|
| **Part A - Introduction** | |
| Subject | Music (Sitar) |
| Semester | IVth |
| Name of the Course | Life Sketch ,Ragas and Taal of Indian Music |
| Course Code | B23-BMI- 401 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | CC |
| Level of the course (As per Annexure-I | 200-299 |
| Pre-requisite for the course (if any) | N.A. |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. The students will be able to describe the Various Ragas of North Indian classical music .<br>2. The students will be able to describe the various Talas of North Indian classical Music.<br>3. The students will be able to illustrate the historical trends of Indian classical music. |

| | |
|---|---|
| | 4. The students will be able to describe the various theoretical aspects of Indian classical music.<br>5. The students will be able to.Perform the various ragas and taalas. |

| Credits | Theory | Practical | Total |
|---|---|---|---|
| | 2 | 2 | 4 |
| Contact Hours | 2 | 4 | 6 |

| | |
|---|---|
| **Max. Marks: 100 (50+50*)**<br>**Internal Assessment Marks: 30 (15+15*)**<br>**End Term Exam Marks: 70 (35+35*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

Question 1 is compulsory comprising of seven sub parts spread over entire syllabus (one marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer Four long questions, at least one question from each unit. All questions carry equal marks.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Ragas**<br>(a) Historical study and detailed description of the Ragas prescribed in the syllabus.<br>(b) Ability to write the notation of any one Maseetkhani Gat in the prescribed Ragas.<br>(c) Ability to write the notation of each Razakhani Gat in the following Ragas:<br>(1) Bhairavi (2) Kedar (3) Asawari | 8 |
| II | **Taal**<br>(a) Ability to write the Thekas with dugun and Chaugan Layakaries in the following Talas:<br>(1) Tivra (2) Sooltaal<br>(b) Importance of Laya in Classical Music . | 8 |

| | | |
|---|---|---|
| | (c) Detailed Study of Types of Instruments. | |
| III | **Musical Terms**<br>(a) Definitions of the following:<br>Geet, Bhajan, Shabad, Folk Song,Filmi Geet,kajri, Chaiti, bhatiali.<br>(b) Write in detail about Sahayak Naad (Syambhu Swar).<br>(c) Merits and Demerits of Notation System. | 7 |
| IV | **Essays and Biographies**<br>(a) Detail study of the following ancient text.<br>(1) Natya Shastra (2) Sangeet Ratnakar.<br>(b) History of music in Medieval Period.<br>(c) Contribution towards Music by the following Musicians:<br>(1) Ustad Amzad Ali Khan (2) Ustad Sujat Khan | 7 |
| V* | **Practical**<br>1. Ability to Perform One Vilambit khyal in any one raga and and Drut Khayal in each of the following Ragas:<br>(1) Bhairavi (2) Kedar (3) Asawari<br>2. Ability to Demonstrate the following taalas in Thah and dugun layakaries :<br>(1) Tivra (2) Sooltaal | 60 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment:30 (15+15*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:15<br>• Mid-Term Exam: | | **End Term Examination:**<br>70 ( 35+35*) |
| **Part C-Learning Resources** | | |

**Recommended Books/e-resources/LMS**

1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande
2. Kramik Pustak Mallika- Part II V. N. Bhatkhande
3. Sangeet Bodh – Sharad Chandra Pranjpayee
4. Hamare Sangeet Ratna- Laxmi Narayan Garg
5. Raag Parichay Part (1-2) - Harishchand Shrivastav
6. Shastriya Sangeet ka vikas – Dr. Amita Sharma

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**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Music | | |
| Semester | IInd | | |
| Name of the Course | Harmonium Playing | | |
| Course Code | B23-SEC 208 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | N.A. | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. **Play** basic alankars on Harmonium with different Talas<br>2. Play various composition on Harmonium for school level<br>3. Play various composition of light music on Harmonium<br>4. Improves ability to Accompaniment with Tabla.<br>5*.Play the given ragas and taalas | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |

| | |
|---|---|
| **Max. Marks:75 (50+25*)**<br>**Internal Assessment Marks: 20 (15+5*)**<br>**End Term Exam Marks:** 55 (35+5*) | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus,it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.

6 .The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | 1. 10 alankar in shuddh swaras with taal.<br>2.Structural knowledge of Harmonium with a sketch<br>3. Importance os Saptak in Harmonium | 8 |
| II | 4. Detailed history of Harmonium and its development in Indian music<br>5. Ability to write Thekas with dugun in the following Talas:<br>(1) Kehrawa (2) Teentaal.<br>6, Detailed study of Darbari Raag . | 8 |
| III | 7. Short notes on the followings:<br>Swar , Shruti, Taan , Raga, Dhun , Aalap,<br>8. Gamak And its Types<br>9.. Importance of Shruti | 7 |
| IV | 10. Importance of Harmonium in Music<br>11. Use of Harmonium as an Accompaniment with vocal and | 7 |

| | | |
|---|---|---|
| | instrumental music<br>12.. Biography and contribution of the following :<br>(1) Ustad Bhure khan (2) Ustad Mahmood Dholpuri | |
| V* | **Practical**<br>1. Ability to play 10 alankar in shuddh swaras with taal.<br>2. Ability to play saraswati vandana and Group song with singing.<br>3. Ability to play one prayer .<br>4. Ability to play One Folk Dhun .<br>5. Ability to play Rashtriya gaan<br>6. Any geet /gazal /Bhajan/ Patriotic song with singing in Darbari Raga | 30 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment: 20 (15+5*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc. 15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc. 5<br>• Mid-Term Exam: | **End Term Examination:**55 (35+20*) |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. Samvadini (Harmonium) - Jayant Bhalodkar
2. Harmonium Vividhaayam - Dr. Vinay Mishra
3. Raag Parichay Part (1-4) – Pt. Harishchand Shrivastav
4. Shastriya Sangeet ka vikas – Dr. Amita Sharma
5. Taal Parichay (1-4) Pt. Girish Chandra Shrivastva

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**Syllabus and Course of Reading for U.G. Programme**
**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | |
|---|---|
| **Part A - Introduction** | |
| Subject | Music |
| Semester | IInd |
| Name of the Course | Guitar |
| Course Code | B23 –SEC-209 |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC |
| Level of the course (As per Annexure-I | 100-199 |
| Pre-requisite for the course (if any) | N.A. |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. The students will be able to describe the origion and development of guitar .<br>2 The students will be able to elubrate the terms and techniques of Guitar .<br>3 The students will be able to define the importance of Guitar in present scenario .<br>4.Demonstarate the Use of Guitar As an Accompany.<br>5*.Play Guitar on Stage |

| Credits | Theory | Practical | Total |
|---|---|---|---|
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |

| | |
|---|---|
| **Max. Marks: 75 (50+25*)**<br>**Internal Assessment Marks: (15+5*)**<br>**End Term Exam Marks:** (35+20*) | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus,it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.
6. The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | 1.1 Origin and development of Guitar.<br>1.2 Structural knowledge of Guitar with Diagram.<br>. | 8 |
| II | 2.1 Different Types of Guitar<br>2.2 Tuning of Guitar. | 8 |
| III | 3.1 Definition of the followings:<br>(a) Major Scale (b) Minor Scale (c) Barre Codes (d) Plucking (e) Scale<br>(f) Tempo<br>3.2 Techniques of using chords in Guitar. | 7 |

| | | |
|---|---|---|
| IV | 4.1 Biography and contribution of following:<br>(a) Pt. Vishwa Mohan Bhatt (b) Brij Bhushan Kabra<br>4.2 Importance of Guitar in Classical Music. | 7 |
| V* | **Practical**<br>1.Ability to play Chords on Guitar from various Major Cord Families<br>2. Ability to play Chords on Guitar from various Minor Cord Families<br>3. Ability to play Guitar with any One Fusion/Folk/Bollywood song .<br>4. Ability to play different Strumming patterns on Guitar.<br>5. Tuning of Guitar. | 30 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment:20 (15+5*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.: 15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: | **End Term Examination:** 55 (35+20*) |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. ***Speed Mechanics for Lead Guitar*** by Troy Stetina
2. ***Music Theory for Guitarists*** by Hal Leonard
3. ***Music Reading for Guitar*** by David Oakes
4. ***Guitar Reading Workbook*** by Barrett Tagliarino
5. ***Pumping Nylon by Scott Tennant***

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**Syllabus and Course of Reading for U.G. Programme**

**UnderNEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **PartA - Introduction** | | | |
| Subject | Music | | |
| Semester | IInd | | |
| Name of the Course | Light Music Vocal | | |
| Course Code | B23-SEC- 210 | | |
| CourseType: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (ifany) | N.A. | | |
| CourseLearningOutcomes(CLO): | After completing this course, the learner will be able to:<br>1. Present and prepare General group song<br>2. Present and prepare Patriotic song<br>3. Perform Folk songs<br>4. Improves knowledge about various talas.<br>5. Perform the given ragas ,taalas and other forms | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |

| | | | |
|---|---|---|---|
| Contact Hours | 2 | 2 | 4 |

| | |
|---|---|
| **Max. Marks: 75 (50+25*)**<br>**Internal Assessment Marks: 20 (15+5*)**<br>**End Term Exam Marks:55 (35+20*)** | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**PartB-Contentsofthe Course**

**Instructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus,it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.
6. The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | 1.1 Five basic Alankar in suddhaswaras<br>1.2 Five Alankars in vikritswaras<br>1.3 Meaning , Defination and Importance of Light Music | 8 |
| II | **2.1** Ability to write the following talas with Thah and Dudunlayakaries<br>Dadra , Kaharwa , Rupak , | 8 |
| III | 3.1 Define the following terms<br>Geet, Gazal, Bhajan, Kawwali,Orchestra<br>Classical Music , Semi Classical Music, Folk Music , | 7 |
| IV | Biographies | 7 |

| | | |
|---|---|---|
| | 1. Lata Mangeshkar<br>2. Kishor Kumar<br>3. Mohd. Rafi.<br>4. Anupjalota | |
| V* | **Practical**<br>1. One Patriotic song<br>2. National Song<br>3.One Geet/ Gazal/ Bhajan with Instruments<br>4. Ability to Demonstrate the following taalas inThah and dugunlayakaries:<br>Dadra , Kaharwa , Rupak , | 30 |

**SuggestedEvaluationMethods**

| | |
|---|---|
| **InternalAssessment:20 (15+5*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.: 10<br>• Mid-Term Exam: 05<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: | **End Term Examination:**<br>**55 (35+20*)** |

**PartC-Learning Resources**

**Recommended Books/e-resources/LMS:**


1. BhatkhandeSangeetShastra- V. N. Bhatkhande
2.Kramik PustakMallika- Part II V. N. Bhatkhande
3. Sangeet Bodh – Sharad Chandra Pranjpayee
4. HamareSangeetRatna- Laxmi Narayan Garg
5. RaagParichay Part (1-2) - HarishchandShrivastav
6. ShastriyaSangeetkavikas – Dr. Amita Sharma

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**Syllabus and Course of Reading for U.G. Programme**
**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Music | | |
| Semester | IInd | | |
| Name of the Course | Tabla Playing | | |
| Course Code | B23-SEC- 211 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | N.A. | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Knowledge of tuning and Nikas in tabla<br>2. Ability to play Theka of Light music taals .<br>3. Capacity to show Thah, Dugun of taal on hand.<br>4. Demonstration of tabla with Bhajan and Geet.<br>5*. Perform the given ragas and taalas | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |

| | |
|---|---|
| **Max. Marks: 75**<br>**Internal Assessment Marks: 20 (15+5*)**<br>**End Term Exam Marks:** 55(35 +20) | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

**Instructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus,it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.

6 .The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | 1.1 Introduction of different parts of Tabla in brief with sketch.<br>1.2 Definitions of the following:Taal, Laya,Taali, Khali, Matra, Vibhag,Sam,Kayda, Palta, Tukda , Tihai. | 8 |
| II | 2.1Knowledge of Bhatkhende notation system in Indian music.<br>2.2 Ability to write Theka, Kayda, Palta and Tihaai in Teentaal with notation. | 8 |
| III | 3.1 Introduction of the following taals in bief: Teentaal, Dadra.<br>3.2 life sketch of renowned tabla players: Ustad zakir hussain ,Ustad taari khan. | 7 |
| IV | 4.1 Brief knowledge of Taal Dash pran<br>4.2 Impotance of Laya in Music<br>4.3 Knowledge of following percussion instruments with their sketches | 7 |

| | | |
|---|---|---|
| | Pakhawaj , Dholak , . | |
| V* | 1. Knowledge of Nikas of Basic syllable of Tabla.<br>2. Ability to Play Theka of Dadra & Kaherwa Taal.<br>3. Two Variation of Dadra Taal<br>4. Knowledge of citation of Theka on hand.<br>Ability to demonstrate Ekgun and Dugun layakari.<br>5. Ability to accompany with Bhajan /Geet. | 30 |

| **Suggested Evaluation Methods** | |
|---|---|
| **Internal Assessment: 20 (15+5*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc. 15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: | **End Term Examination:** 55 (35+20*) |

| **Part C-Learning Resources** |
|---|
| **Recommended Books/e-resources/LMS:**<br>Taal Parichay- Bhaag 1 –Pt.Girish Chandra Srivastava<br>Taal Prasoon –Bhag 1- Pt. Chhotelal Mishra<br>Taal Sarvang- Dr.Vidyanaath Singh<br>Taal Deepika- Mannu ji Mridangacharya |

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**Syllabus and Course of Reading for U.G. Programme**

**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Music | | |
| Semester | IIIrd | | |
| Name of the Course | Kathak Dance | | |
| Course Code | B23-SEC-312 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC | | |
| Level of the course (As per Annexure-I | 200-299 | | |
| Pre-requisite for the course (if any) | N.A. | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>1. Ability to demonstrate basics of kathak dance.<br>2. demonstrate about the south Indian dances.<br>3. Ability to Elaborate various composition of kathak dance.<br>4. Improves ability to Accompaniment with Tabla.<br>5*.Perform kathak dance on stage | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |
| **Max. Marks: 75 (50+25*)**<br>**Internal Assessment Marks:20 (15+5*)**<br>**End Term Exam Marks:** 55 (35+20*) | | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) | |

| | |
|---|---|
| | |

**Part B- Contents of the Course**

**Instructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus,it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.

6 .The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | 1 Meaning, definition and Kinds of the following terms- Kala, Lalit Kala, Sangeet, Natya, , Nritya, Classical- folk dance<br>2. Define the Kathak Dance<br>3. Origin and Development of Kathak Dance. | 8 |
| II | 4. Definition of the following terms- Taal, Laya, Matra, Vibhag, Sam, Taali, Khali, Aavartan, Theka, , Lahra.<br>5. Detailed study of Costumes and ornaments in Kathak .<br>6.Importance of Ghunghroo in kathak dance | 8 |

| | | |
|---|---|---|
| III | **7.** Detail study of Gharana and its Importance in Kathak dance.<br>8. Detail study of Guru-Shishya Prampra.<br>9. Use of Make up in kathak dance | 7 |
| IV | 10. Write the notation of the following in Teentaal:-<br>Tatkar, Thaat, Tihai, Amad, Tukda, Paran, Paran Judi Amad, Chakardar Paran, Chakardar Tukda, Kavit ,Parmelu.<br>11. write the full description of the following Taals with notation of Thaah, Dugun, and Chaugun Layakaris:- a)-Teen Taal, b)Jhaptaal c)-Dadra .<br>12. Importance of Laya and Layakaries in Dance | 7 |
| V* | Practical<br><br>1. Prectical demonstration of taal –Teen taal<br>Tatkar in Teentaal with Thah , Dugun layakaries with Padhant<br>2. Ability to take spins of five feet and three feet.<br>3. Five types of hand movement<br>4. One Rangmanch ka Tukra<br>5. Two Simple Tukra<br>6. Padhant of Thah Dugun layakaries on hands in Dadra taal | 30 |
| **Suggested Evaluation Methods** | | |
| **Internal Assessment: 20 (15+5*)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc. 15<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc. 5<br>• Mid-Term Exam: | | **End Term Examination:**55 (35+20*) |
| **Part C-Learning Resources** | | |

**Recommended Books/e-resources/LMS:**

1. Natya shastra: Bharat Muni
2. Abhinay Darpan: Abhinav Gupt
3. Kathak Nritya Parichay: Harishchandra Shrivastava
4. Kathak Nritya Shiksha: Dr. Puru Dadheech
5. Kathak Nritya: LAKSHMI NARAYAN GARG
6. Kathak Nartan: Vidi Nagar
7. Kathak Gyaneswari: Pt. Tirathram Azad
8. Sangeet Nritya Kathak: Vidi Nagar
9. All Recommended books by teachers

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**Under NEP- 2020 (W.E.F. 2023-24)**

| **Session: 2023-24** | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Music | | |
| Semester | IIIrd | | |
| Name of the Course | Classical singing | | |
| Course Code | B23-SEC- 313 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | N.A | | |
| Course Learning Outcomes(CLO): | After completing this course, the learner will be able to:<br>6. The students will be able to present and prepare General group song<br>7. The students will be able to present and prepare Patriotic song<br>8. The student will be able to perform Folk song<br>9. Imparts knowledge about various talas. | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |
| **Max. Marks: 75 (50+25*)**<br>**Internal Assessment Marks: 20 (15+5*)**<br>**End Term Exam Marks: 55 (35+20*)** | | **Time:** 3 Hours (Theory) /<br>6 hrs. (Practical) | |

| Part B- Contents of the Course |
|---|

**Instructions for Paper- Setter**

1. There shall be Nine Questions in all.
2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus,it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.

6 .The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | **Music and Sound**<br>I.I Music and its types – Classical , Semi Classical , Folk Music and Light music.<br>I.2 Sound ,Vibration , Frequeancy.<br>I.3 Naad and its types Aahat Naad ,Anhat Naad. | 8 |
| II | **Musical terms**<br>(a) Shruti ,swar ,Shuddha Swar, Vikrit Swar<br>.(b) Laya and its types<br>(c) Relationship Between Classical and | 8 |
| III | **3. Ragas and Taalas ,**<br>(a) Detail study of Following Ragas<br>Kafi , Khamaj<br>(b) Theka , Avartan , Taali , Khali, Sam ,Vibhag.<br>(c) Ability to write the following talas with Thah and Dugun layakaries<br>Teen Taal , Kaharwa , Dadra | 7 |

| | | |
|---|---|---|
| IV | **4. Biographies**<br><br>(a) Contribution of Pt. Vishnu Narayan Bhatkhande in Indian Classical Music<br><br>(b) Contribution of Pt. Vishnu Digamber Paluskar in Indian Classical Music<br><br>(c) Knowledge of Ten Thats of Pt. Bhatkhande | 7 |
| V* | **Practical**<br><br>5.1 Five basic Alankar in shuddha swaras.<br>5.2 Ability to perform Drut Khyals in following Ragas Kafi , Khamaj<br>5.3 One Sargam Geet in any raga fo prescribed syllabus<br>5..4 Two film songs based on ragas. | 30 |
| **Suggested Evaluation Methods** | | |
| ➢ **Internal Assessment: 20 (15+5*)**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.: 10<br>• Mid-Term Exam:<br><br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: | | **End Term Examination:**<br>55 (35+20*) |
| **Part C-Learning Resources** | | |

**Recommended Books/e-resources/LMS:**

1.
1. Bhatkhande Sangeet Shastra- V. N. Bhatkhande
2.Kramik Pustak Mallika- Part II V. N. Bhatkhande
3. Sangeet Bodh – Sharad Chandra Pranjpayee
4. Hamare Sangeet Ratna- Laxmi Narayan Garg
5. Raag Parichay Part (1-2) - Harishchand Shrivastav
6. Shastriya Sangeet ka vikas – Dr. Amita Sharma

# Format for Designing the Syllabus of a Course

| Session: 2023-24 | | | |
|---|---|---|---|
| **Part A - Introduction** | | | |
| Subject | Music | | |
| Semester | IIIrd | | |
| Name of the Course | Haryanvi Dance | | |
| Course Code | B23-SEC-314 | | |
| Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC) | SEC | | |
| Level of the course (As per Annexure-I | 100-199 | | |
| Pre-requisite for the course (if any) | NA | | |
| Course Learning Outcomes (CLO): | After completing this course, the learner will be able to:<br>1. Elaborate about Haryanvi Folk music.<br>2. Demonstrate about Haryanvi Folk dance.<br>3. Importance of Haryanvi culture and music.<br>4. Elaborate about Haryanvi culture and dance<br>5. Present Haryanvi dance on stage | | |
| Credits | Theory | Practical | Total |
| | 2 | 1 | 3 |
| Contact Hours | 2 | 2 | 4 |
| **Max. Marks: 75 (50+25)**<br>**Internal Assessment Marks:15+5**<br>**End Term Exam Marks:** 35+20 | | **Time: 2hours** | |
| **Part B- Contents of the Course** | | | |
| **Instructions for Paper- Setter**<br>1. There shall be Nine Questions in all. | | | |

2. The Question paper will be divided into five units.
3. Paper Setter has to set 2 questions from each unit of syllabus given below ,a total of 8 questions from all 4 units.
4. The Question no. nine (Unit- V) will be and compulsory and covers the whole syllabus,it contains 5 objective type questions of two marks each.
5. All questions Carry equal marks.

6 .The candidates shall be required to attempt five questions in all, selecting one question from first four units and 9th question(Vth Unit) will be compulsory to attempt.

| Unit | Topics | Contact Hours |
|---|---|---|
| I | 1. Introduction to folk dance of Haryana<br>2. Meaning, Definitions, Feature of folk dances in Haryana<br>3. Define the following Folk Dance of Haryana:<br>Gugga, Jhumar, Phag Dance, Daph, Dhamal, Loor, Khodiya,, Rasiya. | 8 |
| II | 4. Define the Haryanvi Folk dance Costumes and Ornaments for Male and Female Dancers.<br>5. Importance of Nagma in Haryanvi dance<br>6. Define in details of the Following Instruments: Dholak, Nagara, Nagari, Harmonium, Ghunghru, Sarangi, Clarnate, Manjira, , Benjo, | 8 |
| III* | 7. Relationship Between Haryanvi Folk Dances and Aesthetics.<br>8. The study of Folk Musical instruments of Haryana.<br>9. Importance of laya and tal in Haryanvi dance | 7 |
| IV | 10. Importance of makeup in Haryanvi dance.<br>11. Life sketch of Pt. Lakhmi Chand.<br>12. Define the followings: | 7 |

| | | |
|---|---|---|
| | Aalah, Bhairavi tabi, Stage presentation, Formation. | |
| V* | **Practical Viva & Stage Performance**<br>1. Ability to demonstrate the following Talas on hand :<br>Deepchandi, Rupak, Kehrva, Dadra.<br>2. Ability to perform the following Folk Dances of Haryana .<br>Gugga, Jhumar, Phag Dance, Daph, Dhamal, Loor, Khodiya,, Rasiya. | 30 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment: 20 (15+5)**<br>➢ **Theory**<br>• Class Participation:<br>• Seminar/presentation/assignment/quiz/class test etc.:<br>• Mid-Term Exam:<br>➢ **Practicum**<br>• Class Participation:<br>• Seminar/Demonstration/Viva-voce/Lab records etc.:<br>• Mid-Term Exam: | **End Term Examination:**<br>(35+20) |

**Part C-Learning Resources**

**Recommended Books/e-resources/LMS:**

1. Cultural Study of Haryanvi and Braj Folk Songs: Dilbagh Sing
2. Haryanvi lok sangeet
3. Origin And Development of Haryanvi Music: Ram mehar singh
4. Haryana: D.C verma
5. Social Studies of Haryanvi Folk Literature: Jaiprakash Sharma
6. Haryanvi Folklore and Ahmedbaksh Thanesari: Krishnachand Ralah

7. Haryanvi Dance and Songs: A Study: Anil Savera

8. Folk Humor In Haryanvi Prose (Jokes And Folktales): Ramphal Chahal

9. Haryanvi Song: A Perusal: Purnchand Sharma

10. Haryanvi Folk Stories: Shankar Lal Yadav

11. Haryana ka lok Sangeet: Gita Dhankar

# KURUKSHETRA UNIVERSITY
# KURUKSHETRA

## Scheme of Examination and Syllabus for Under-Graduate Programme (Subject: Fine Arts) Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020 w.e.f. 2023-24 (in phased manner)

Chairman,
Department of Fine Arts
Kurukshetra University,
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# DEPARTMENT OF FINE ARTS, KURUKSHETRA UNIVERSITY, KURUKSHETRA

## Scheme of Examination for Under-Graduate Programme
## Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020
## w.e.f. 2023-24 (in phased manner)
## Subject: Fine Arts

**SEMESTER-1**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A & C | CC-1 MCC-1 4 credit | B23-FTA-101 | Fundamental of Arts | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical(Object Study) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme C only | MCC-2 4 credit | B23-FTA-102 | Elements of Art | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical(2D Design) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme A | CC-M1 2 credit | B23-FTA-103 | Introduction of Fine Arts | 1 | 1 | 10 | 20 | 30 | 3 hrs. |
| | | | Practical (Drawing-I) | 1 | 2 | 5 | 15 | 20 | 4 hrs. |
| Scheme A & C | MDC-1 3 credit | B23-FTA-104 | Basics of Fine Arts-I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Sketching) | 1 | 2 | 5 | 20 | 25 | 4 hrs. |

**SEMESTER-2**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A & C | CC-2 MCC-3 4 credit | B23-FTA-201 | Approach to Methods & Materials | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Still Life) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme C only | DSEC-1 4 credit | B23-FTA-202 | Introduction to Drawing | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Drawing) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme A only | CC-M2 2 credit | B23-FTA-203 | Introduction to History of Art | 1 | 1 | 10 | 20 | 30 | 3 hrs. |
| | | | Practical (Basic Drawing) | 1 | 2 | 5 | 15 | 20 | 4 hrs. |
| Scheme A & C | MDC-2 3 credit | B23-FTA-204 | Basics of Fine Arts –II | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Painting) | 1 | 2 | 5 | 20 | 25 | 4 hrs. |

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## Scheme of Examination for Under-Graduate Programme
## Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020
## w.e.f. 2023-24 (in phased manner)
## Subject: Fine Arts

| SEMESTER-3 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
| Scheme A, B & C | CC-3 MCC-4 4 credit | B23-FTA-301 | Introduction to Art & Aesthetics | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Nature Study-I) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | MCC-5 4 credit | B23-FTA-302 | Introduction to Murals | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Mural) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme A, B & C | MDC-3 3 credit | B23-FTA-303 | Introduction to Painting | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Painting) | 1 | 2 | 5 | 20 | 25 | 4 hrs. |
| SEMESTER-4 | | | | | | | | | |
| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
| Scheme A, B & C | CC-4 MCC-6 4 credit | B23-FTA-401 | Introduction to Indian Art (Pre-historic to Ancient) | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Nature Study-II) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | MCC-7 4 credit | B23-FTA-402 | Study of Western Landscape | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Landscape) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | MCC-8 4 credit | B23-FTA-403 | Study of Indian Landscape | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Landscape) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | DSE-1 4 credit Select one option | B23-FTA-404 | Calligraphy | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-FTA-405 | 2D Design | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

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**DEPARTMENT OF FINE ARTS, KURUKSHETRA UNIVERSITY, KURUKSHETRA**
**Scheme of Examination for Under-Graduate Programme**
**Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020**
**w.e.f. 2023-24 (in phased manner)**
**Subject: Fine Arts**

| SEMESTER-5 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
| Scheme A, B & C | CC-5 MCC-9 4 credit | B23-FTA-501 | History of Medieval Indian Art | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | MCC-10 4 credit | B23-FTA-502 | History of Medieval European Art | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | DSE-2 4 credit Select one Option | B23-FTA-503 | Head Study | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-FTA-504 | Geometrical Drawing | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | DSE-3 4 credit Select one Option | B23-FTA-505 | Figure Study | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-FTA-506 | Animal Drawing | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| SEMESTER-6 | | | | | | | | | |
| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
| Scheme A, B & C | CC-6 MCC-11 4 credit | B23-FTA-601 | Folk & Tribal Art | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | MCC-12 4 credit | B23-FTA-602 | Cave Paintings | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | DSE-4 4 credit Select one Option | B23-FTA-603 | Mosaic | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-FTA-604 | Collage painting | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | DSE-5 4 credit Select one Option | B23-FTA-605 | Glass Painting | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-FTA-606 | Clay Moulding | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

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# DEPARTMENT OF FINE ARTS, KURUKSHETRA UNIVERSITY, KURUKSHETRA

## Scheme of Examination for Under-Graduate Programme
## Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020
## w.e.f. 2023-24 (in phased manner)
## Subject: Fine Arts

| SEMESTER-7 (FOR HONOURS/HONOURS WITH RESEARCH IN FINE ARTS) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
| For Honours in Fine Arts/ Honours with Research in Fine Arts | CC-H1 4 credit | B23-FTA-701 | History of European Art | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | CC-H2 4 credit | B23-FTA-702 | Life Study -I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | CC-H3 4 credit | B23-FTA-703 | Painting Composition | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | DSE-H1 4 credit Select one Option | B23-FTA-704 | Mural - I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-FTA-705 | Plein Air Painting - I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | PC-H1 4 credit | B23-FTA-706 | Miniature Painting-I | 4 | 8 | 30 | 70 | 100 | 6 hrs. |

| SEMESTER-8 (FOR HONOURS IN FINE ARTS) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
| Honours in Fine Arts | CC-H4 4 credit | B23-FTA-801 | History of Modern Western Art | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | CC-H5 4 credit | B23-FTA-802 | Life Study- II | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | CC-H6 4 credit | B23-FTA-803 | Creative Painting Composition | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | DSE-H2 4 credit Select one option | B23-FTA-804 | Mural - II | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-FTA-805 | Plein Air Painting - II | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | PC-H2 4 credit | B23-FTA-806 | Wall Painting | 4 | 8 | 30 | 70 | 100 | 6 hrs. |

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| OR SEMESTER-8 (FOR HONOURS WITH RESEARCH IN FINE ARTS) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Remarks** | **Course Type** | **Course Code** | **Name of the Course** | **Credit** | **Contact Hours/ Week** | **Internal Assessment marks** | **End Term Marks** | **Max. Marks** | **Exam Duration** |
| **Honours with Research in Fine Arts** | **CC-H4 4 credit** | **B23-FTA-801** | **History of Modern Western Art** | **2** | **2** | **15** | **35** | **50** | **3 hrs.** |
| | | | **Practical** | **2** | **4** | **15** | **35** | **50** | **6 hrs.** |
| | **CC-H5 4 credit** | **B23-FTA-802** | **Life Study- II** | **2** | **2** | **15** | **35** | **50** | **3 hrs.** |
| | | | **Practical** | **2** | **4** | **15** | **35** | **50** | **6 hrs.** |
| | **Project/ Dissertation 12 credit** | **B23-FTA-807** | **Project/ Dissertation** | **8+4** | **-** | **-** | **-** | **-** | **-** |

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| FINE ARTS: SEMESTER-I | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Remarks** | **Course Type** | **Course Code** | **Name of the Course** | **Credit** | **Contact Hours/ Week** | **Internal Assessment marks** | **End Term Marks** | **Max. Marks** | **Exam Duration** |
| **Scheme A & C** | **CC-1 MCC-1 4 credit** | **B23-FTA-101** | **Fundamental of Arts** | **2** | **2** | **15** | **35** | **50** | **3 hrs.** |
| | | | **Practical (Practical (Object Study)** | **2** | **4** | **15** | **35** | **50** | **6 hrs.** |

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)-** After completion of the course students will be able to:

1. To develop an understanding of the fundamental elements and principles of art.
2. To apply various techniques and mediums to create visual artworks.
3. To interpret artworks using critical thinking and aesthetic judgment.
4. To express their artistic ideas and concepts clearly through visual language.
5. To analyze the visual structure, details and relationships of objects to create accurate and convincing drawings.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be a short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Art: meaning, definition and purpose<br>Exploring the interdisciplinary scope of art. | 8 |
| II | Introduction to various classification of art, including visual arts, performing arts, applied art, sculpture, printmaking etc. | 8 |
| III | Introduction to the elements of art and understanding the characteristics and significance of each element: line, shape, form, color, value, texture, and space. | 7 |
| IV | Introduction to the principles of art: balance, contrast, emphasis, movement, pattern, rhythm, and unity. | 7 |
| V<br>Practical | Practical:<br>1. Study of the proportion, shape, form, texture of the object.<br>2. Object drawing : Study of various objects like glass, jug, bottle or any other daily life objects.<br>3. Practice of various mediums like pencil, watercolor, soft pastel etc.<br>4. Drawing composed objects more than 2 to 3 objects to develop the sense of composition and perspective.<br>No. of Assignments - 10 | 60 |

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| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory: 15**<br>· Class Participation:04<br>· Seminar/presentation/assignment/quiz/class test etc.:04<br>· Mid-Term Exam:07<br>➢ **Practicum: 15**<br>· Class Participation:05<br>· Seminar/Demonstration/Viva-voce/Lab records etc.:10<br>· Mid-Term Exam: | **End Term Examination:Written Exam:35**<br><br>**Practicum:**<br>**Practical Exam :35** |

**Part C- Learning Resources**

**Recommended Books/e-resources/LMS:**

1. Rupa Prada Kala keMuladhar- R. A. Agarwal and S.K. Sharma
2. BhartiyaChitrakalaKaltihas- VachaspatiGairola
3. BhartiyaMurtikala- - Ramnath Mishra
4. BhartiyaChitrakalakaitihas- AvinashBahadurVerma
5. Bhartiyakala – A.L. Shrivasta
6. Indian Sculpture- Stella Kramrisch
7. A handbook of method and material- Ray Smith

**FINE ARTS: SEMESTER-I**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme C only | MCC-2 4 credit | B23-FTA-102 | Elements of Art | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (2D Design) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)-** After completion of the course students will be able to:

1. To understand the fundamental elements and principles of art.
2. To apply various techniques and mediums to create visual artworks.
3. Interpret artworks using critical thinking and aesthetic judgment.
4. To express their artistic ideas and concepts clearly through visual language.
5. To apply elements and principles to create visually appealing and well-organized 2D designs.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

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| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Elements of Art<br>Line and Shape: Exploration of different types of lines.<br>Understanding the concept of shape and its visual composition. | 8 |
| II | Form and Space : Definition of form and space in art.<br>Value and Contrast<br>Texture<br>Colour : Understanding the properties of colour (hue, value and saturation | 8 |
| III | Principles of design : Balance, Emphasis, Proportion, Repetition, Rhythm, Pattern, Movement, Unity | 7 |
| IV | Applications of Elements and Principles of Art<br>Understanding the significance and purpose of Elements of Art | 7 |
| V<br>Practical | Practical :<br>1. Create a 2D design using lines and shapes (medium - pencil).<br>2. Creating 2D designs using natural forms which incorporate repetition, balance, overlapping and harmony.<br>3. Design a color wheel and explore colour harmony.<br>4. Create a 2D with letters and symbols using a monochromatic scheme.<br>No. of assignments - 10 | 60 |

**Suggested Evaluation Methods**

| Internal Assessment: | End Term Examination: |
|---|---|
| ➢**Theory: 15**<br>·Class Participation: 4<br>·Seminar/presentation/assignment/quiz/class test etc.: 4<br>·Mid-Term Exam: 7<br>➢**Practical: 15**<br>·Class Participation: 5<br>·Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>·Mid-Term Exam: NA | ➢**Theory**<br>·Written Examination: 35<br>➢**Practical**<br>Practical Examination: 35 |

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| Learning Resources |
|---|
| 1. Rupa Prada Kala keMuladhar- R. A. Agarwal and S.K. Sharma<br>2. The Seven Elements of Art - Bretta Reed Staley<br>3. Fundamnetal of Visual art- Muneesh Kumar<br>4. The elements of colour- Johannes Itten<br>5. Bhartiya Kala- A. l. Shrivastava |

**FINE ARTS: SEMESTER-I**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A | CC-M-1 4 credit | B23-FTA-103 | Introduction to Fine Arts | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Drawing) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

Level of the course: 100-199

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)-** After completion of the course students will be able to

1. To understand of various forms and styles of art.
2. To critically evaluate and interpret artworks from different styles.
3. To encourage creative thinking and problem solving activities in the context of artistic expression.
4. To exhibit basic proficiency in developing artistic skills.
5. To demonstrate proficiency in observational drawing techniques by accurately representing objects, figures using appropriate proportions, perspective, shading, and composition.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be a short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Fine Arts<br>Definition and scope of Fine Arts<br>Overview of different art forms : (Painting, Sculpture, Drawing, Printmaking etc.) | 8 |
| II | Exploring 2 Dimensional art forms<br>Painting: Introduction to various painting styles and approaches, famous artists and their contribution to art.<br>Drawing: Basic drawing techniques (contour, gesture, shading etc.) | 8 |
| III | Exploring 3 dimensional art forms<br>Sculpture: Introduction to sculpture materials , techniques, styles etc.<br>Installation art: Definition and conceptual approaches | 7 |
| IV | Art and culture: Art as a reflection of culture in society. | 7 |

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| | | |
|---|---|---|
| **V Practical** | 1. Drawing of everyday objects such as fruits, flowers, utensils, or household items.<br>2. Drawing of natural objects like shells, rocks, leaves, or flowers and natural scenery.<br>3. basic drawing tools and materials, different drawing techniques such as line drawing, shading, and texture.<br>4. different drawing media, such as graphite pencils, charcoal, ink, and pastels.<br>5. Understanding the unique properties of each medium and their effects on drawing techniques.<br>No. of assignments - 10 | **60** |

**Suggested Evaluation Methods**

| **Internal Assessment:** | **End Term Examination:** |
|---|---|
| ➢**Theory: 15**<br>·Class Participation: 4<br>·Seminar/presentation/assignment/quiz/class test etc.: 4<br>·Mid-Term Exam: 7<br>➢**Practicum: 15**<br>·Class Participation: 5<br>·Seminar/Demonstration/Viva-voce/Lab records etc.: 10<br>·Mid-Term Exam: NA | ➢**Theory**<br>·Written Examination: 35<br>➢**Practicum**<br>Practical Examination: 35 |

**Learning Resources**

1. Keys to Drawing - Bret Dodson
2. How to Draw what you see - Rudy De Reyna
3. Fundamentals of Visual Art - Muneesh Kumar
4. Drawing and Painting Course - A.H. Hashmi

**FINE ARTS: SEMESTER-I**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| **Scheme A & C** | **MDC-1 3 credit** | **B23-FTA-104** | Basics of Fine Arts-I | **2** | **2** | **15** | **35** | **50** | **3 hrs.** |
| | | | **Practical (Sketching)** | **1** | **2** | **5** | **20** | **25** | **4 hrs.** |

Level of the course: 100-199

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)-** After completion of the course students will be able to:

1. To understand the fundamental elements and principles of art.
2. To relate various elements and principles of art with the surrounding objects from nature.
3. To Understand color theory.
4. To Interpret different types of lines in creating various forms.
5. To express their artistic ideas and concepts clearly through sketching and drawing.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be a short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Elements of Art<br>1. Colour, its types and color theory<br>2. Study of hue, tone, tint, value, intensity, shade, etc. | 8 |
| II | 1. Definition of space and its types. Understanding two- dimensional and three-dimensional space from surroundings.<br>2. Understanding Texture and experimenting various textures | 8 |

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|---|---|---|
| III | 1. Line and its types- horizontal, vertical, diagonal, zigzag, etc.<br>2. Define Chiaroscuro | 7 |
| IV | Introduction to Principles of art : Balance, Emphasis, Proportion, Repetition, Rhythm, Pattern, Movement, Unity, etc. | 7 |
| V<br>Practical | Sketching-<br>Use of different types of Pencil- 2B, 4B, 8B, etc.<br>Creative composition of Human forms, Animals etc.<br>Memory drawing<br>Human anatomy study- lips, nose, eyes, ears,etc.<br>Object drawing from surroundings.<br>Assignments: 10 | 30 |

**Suggested Evaluation Methods**

| Internal Assessment: | End Term Examination: |
|---|---|
| ➢**Theory: 15**<br>·Class Participation: 4<br>·Seminar/presentation/assignment/quiz/class test etc.: 4<br>·Mid-Term Exam: 7<br>➢**Practicum : 05**<br>·Class Participation: 02<br>·Seminar/Demonstration/Viva-voce/Lab records etc.: 03<br>·Mid-Term Exam: NA | ➢**Theory**<br>·Written Examination: 35<br>➢**Practicum**<br>Practical Examination: 20 |

**Learning Resources**


1. RupaPraga Kala keMulaadhar by R. A. Aggarwal and S. K. Sharma
2. Fundamentals of Visual Arts by Muneesh Kumar
3. Visual Arts: A Basic Study by GajananBhagwat and Arvind Desai


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| FINE ARTS: SEMESTER-III | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Remarks** | **Course Type** | **Course Code** | **Name of the Course** | **Credit** | **Contact Hours/ Week** | **Internal Assessment marks** | **End Term Marks** | **Max. Marks** | **Exam Duration** |
| **Scheme A & C** | **CC-3 MCC-1 4 credit** | **B23-FTA-301** | **Introduction to Art & Aesthetics** | **2** | **2** | **15** | **35** | **50** | **3 hrs.** |
| | | | **Practical (Nature Study)** | **2** | **4** | **15** | **35** | **50** | **6 hrs.** |

Level of the course: 200-299

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)-** After completion of the course students will be able to:

1. To develop a deep understanding of the principles and concepts of Indian aesthetics. Gain an appreciation for various traditional Indian art forms.
2. To examine the philosophical underpinnings of Indian aesthetics, including concepts of truth, beauty, and goodness (Satyam, Shivam, Sundaram).
3. To understand the colour theory of nature and be able to create various hues apart from the given palette.
4. To develop a strong observational ability and enhance their compositional skills.
5. To understand the geometry of various natural and manmade objects.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be a short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Definition of Philosophy, scope and nature<br>Meaning of Aesthetics<br>An overview of Indian Aesthetics | 8 |
| II | Rasa Theory of Bharat Muni<br>- Understanding the concept of Rasa-Nishpatti Theory and its various forms.<br>- Exploring different types and components of Rasa and Bhaav. | 8 |
| III | Shadanga - The Six Limbs of Indian Art | 7 |
| IV | Dhwani Theory, Auchitya, Riti.<br>- Exploring the concepts of Dhwani, Auchitya (appropriateness), and Riti (style) in Indian aesthetics. | 7 |

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|---|---|---|
| V<br>Practical | Practical (Nature Study)<br>1. Drawing from Nature, like Flower, Fauna, Leaf, Shape of different plant, tree etc.<br>2. Painting from objects and nature to study from color, tone and texture.<br>3. Study of perspective.Difference in handling of nearer and distant objects-controlled light and shade.<br>4. Ability to simplify Study of Still Life/ Still Objects from nature treating the essential omitting detail. | 60 |

**Suggested Evaluation Methods**

| Internal Assessment: | End Term Examination: |
|---|---|
| ➢**Theory: 15**<br>·Class Participation: 4<br>·Seminar/presentation/assignment/quiz/class test etc.: 4<br>·Mid-Term Exam: 7<br>➢**Practicum: 15**<br>·Class Participation: 02<br>·Seminar/Demonstration/Viva-voce/Lab records etc.: 03<br>·Mid-Term Exam: NA | ➢**Theory**<br>·Written Examination: 35<br>➢**Practicum**<br>Practical Examination: 20 |

**Learning Resources**

1. An Introduction to Indian Philosophy- Satish Chandra Chaterjee
2. Art and Aesthetics - Nupur Sharma and PrakashVeereshwar
3. Introduction to Aesthetics- AnandAmaldas
4. Shaundaryashashtra- Dr. MamtaChaturbedi

**FINE ARTS: SEMESTER-3**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme B & C | MCC-5 4 credit | B23-FTA-302 | Introduction to Mural | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical (Mural) | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

Level of the course: 200-299

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)-** After completion of the course students will be able to

1. To demonstrate a comprehensive understanding of mural painting, including its history, styles, and significance in public spaces.
2. To apply the principles of design and composition to develop visually engaging and conceptually rich mural designs.
3. To utilize various techniques and tools for mural painting, including paint application, color mixing, and texture creation.
4. To safely and effectively prepare mural surfaces, ensuring proper priming and base coating.
5. To transfer mural designs accurately onto large-scale surfaces while maintaining the intended proportions and scale.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be a short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

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| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Mural: : Understanding Mural Art<br>History, Purpose, and Significance of mural art | 8 |
| II | Materials and Tools for Mural Creation<br>Planning and Preparation: Research and Concept Development | 8 |
| III | Color Theory and Color Mixing for Mural Art<br>Incorporating Texture and Mixed Media in Murals | 7 |
| IV | Preservation and Maintenance of Murals | 7 |
| V<br>Practical | Mural<br>Surface Preparation: Cleaning, Priming, and Base Coating<br>Paint Application Techniques: Brushes, Rollers, and Spray Paint<br>Color Theory and Mixing for Mural Painting<br>Creating Depth and Dimension through Layering and Blending<br>Incorporating Texture and Mixed Media in Mural Painting<br><br>No. of Assignments: 04 | 60 |

**Suggested Evaluation Methods**

| Internal Assessment: | End Term Examination: |
|---|---|
| ➢**Theory: 15**<br>·Class Participation: 4<br>·Seminar/presentation/assignment/quiz/class test etc.: 4<br>·Mid-Term Exam: 7<br>➢**Practicum: 15**<br>·Class Participation: 02<br>·Seminar/Demonstration/Viva-voce/Lab records etc.: 03<br>·Mid-Term Exam: NA | ➢**Theory**<br>·Written Examination: 35<br>➢**Practicum**<br>Practical Examination: 20 |

**Learning Resources**


1. "History of Indian Wall Painting" by Pupul Jayakar
2. "Fresco Painting: Techniques for Muralists and Decorative Painters" by Alwyn Crawshaw
3. "The Murals of Tibet" by Thomas Laird and Robert A. F. Thurman
4. "Mural Art: Wall Paintings in Flanders and the Northern Netherlands" by Max J. Friedlander
5. "Mural Paintings of Ajanta Caves" by Dieter Schlingloff
6. "From Assyria to Iberia: Crossing Continents: Wall Paintings from the Round City of Bagdad" by Dr. Stephanie Dalley
7. "Maya Art and Architecture (World of Art)" by Mary Ellen Miller
8. Mural paintings in India: A historical, technical, and archaeological perspective - J. C. Nagpal


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| FINE ARTS: SEMESTER-III | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Remarks** | **Course Type** | **Course Code** | **Name of the Course** | **Credit** | **Contact Hours/ Week** | **Internal Assessment marks** | **End Term Marks** | **Max. Marks** | **Exam Duration** |
| **Scheme A,B & C** | **MDC-3 3 credit** | **B23-FTA-303** | **Introduction to Painting** | **2** | **2** | **15** | **35** | **50** | **3 hrs.** |
| | | | **Practical-(Painting)** | **1** | **2** | **5** | **20** | **25** | **4 hrs.** |

Level of the course:

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO):** After completion of the course students will be able to:

1. To demonstrate technical proficiency in various painting mediums, techniques, and tools, incorporating composition and design principles to execute still life, landscape, and figure paintings effectively.
2. To develop their artistic voice and conceptual understanding, employing critical thinking skills.
3. To analyze and interpret their own artwork and that of others, while engaging in constructive artistic discussions and critique sessions
4. Enable Students to express their creativity and individuality through painting, encouraging them to develop a unique artistic style.
5. Provide an understanding of the historical and cultural context of various painting styles and movements, helping students appreciate the evolution of art.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be a short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Painting Materials and Techniques<br>various painting mediums such as oil, acrylic, watercolor, and gouache<br>Exploration of different painting surfaces, including canvas, paper, and wood panels | 8 |
| II | Understanding brushes, palette knives, and other painting tools<br>Basic color theory and mixing techniques<br>different painting techniques, such as glazing, scumbling, wet-on-wet, and drybrush | 8 |
| III | Study of still life as a subject in painting<br>Understanding the principles of light and shadow in still life compositions | 7 |
| IV | Techniques for creating texture and form in still life paintings<br>Color harmonies and relationships in still life arrangements | 7 |

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|---|---|---|
| **V**<br>**Practical** | **Painting**<br>1. Introduction to different painting mediums such as watercolours, oil pastels, oil colors, pencil colors.<br>2. Understanding painting tools and materials.<br>3. Colour theory and color wheel.<br>4. Introduction to shading and perspective.<br>5. Capturing light and shade in a detailed still life.<br>6. Painting a landscape in the preferred medium .<br><br>No. of Assignments: 05 | **30** |

| **Suggested Evaluation Methods** | |
|---|---|
| **Internal Assessment:**<br>➢**Theory: 15**<br>·Class Participation: 4<br>·Seminar/presentation/assignment/quiz/class test etc.: 4<br>·Mid-Term Exam: 7<br>➢**Practical: 15**<br>·Class Participation: 02<br>·Seminar/Demonstration/Viva-voce/Lab records etc.: 03<br>·Mid-Term Exam: NA | **End Term Examination:**<br>➢**Theory**<br>·Written Examination: 35<br>➢**Practical**<br>Practical Examination: 20 |
| **Learning Resources** | |
| "The Artist's Handbook of Material and Techniques" by Ralph Mayer<br>Bhartiya Kala- A. l. Shrivastava | |

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# KURUKSHETRA UNIVERSITY
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## Scheme of Examination and Syllabus for

## Under-Graduate Programme

## (Subject: Commercial Art)

## Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020w.e.f. 2023-24 (in phased manner)

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**DEPARTMENT OF FINE ARTS, KURUKSHETRA UNIVERSITY, KURUKSHETRA**
**Scheme of Examination for Under-Graduate Programme**
**Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020**
**w.e.f. 2023-24 (in phased manner)**
**Subject: Commercial Art**

| SEMESTER-1 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Remarks** | **Course Type** | **Course Code** | **Name of the Course** | **Credit** | **Contact Hours/ Week** | **Internal Assessment marks** | **End Term Marks** | **Max. Marks** | **Exam Duration** |
| **Scheme A & C** | **CC-1 MCC-1 4 credit** | B23-COA-101 | Fundamental of Arts | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Scheme C only** | **MCC-2 4 credit** | B23-COA-102 | Introduction to Design | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Scheme A** | **CC-M1 2 credit** | B23-COA-103 | Introduction of Fine Arts | 1 | 1 | 10 | 20 | 30 | 3 hrs. |
| | | | Practical | 1 | 2 | 5 | 15 | 20 | 4 hrs. |
| **Scheme A & C** | **MDC-1 3 credit** | B23-COA-104 | Basics of Fine Arts-I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 1 | 2 | 5 | 20 | 25 | 4 hrs. |
| **SEMESTER-2** | | | | | | | | | |
| **Remarks** | **Course Type** | **Course Code** | **Name of the Course** | **Credit** | **Contact Hours/ Week** | **Internal Assessment marks** | **End Term Marks** | **Max. Marks** | **Exam Duration** |
| **Scheme A & C** | **CC-2 MCC-3 4 credit** | B23-COA-201 | Basics of Drawing | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Scheme C only** | **DSEC-1 4 credit** | B23-COA-202 | Art of Photography | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Scheme A only** | **CC-M2 2 credit** | B23-COA-203 | Basics of Photography | 1 | 1 | 10 | 20 | 30 | 3 hrs. |
| | | | Practical | 1 | 2 | 5 | 15 | 20 | 4 hrs. |
| **Scheme A & C** | **MDC-2 3 credit** | B23-COA-204 | Basics of Fine Arts-II | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 1 | 2 | 5 | 20 | 25 | 4 hrs. |

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# DEPARTMENT OF FINE ARTS, KURUKSHETRA UNIVERSITY, KURUKSHETRA
## Scheme of Examination for Under-Graduate Programme
## Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020
## w.e.f. 2023-24 (in phased manner)
## Subject: Commercial Art

| SEMESTER-3 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Remarks** | **Course Type** | **Course Code** | **Name of the Course** | **Credit** | **Contact Hours/ Week** | **Internal Assessment marks** | **End Term Marks** | **Max. Marks** | **Exam Duration** |
| **Scheme A, B & C** | **CC-3 MCC-4 4 credit** | B23-COA-301 | Advertising and Society | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Scheme B & C** | **MCC-5 4 credit** | B23-COA-302 | Advertising Foundation | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Scheme A, B & C** | **MDC-3 3 credit** | B23-COA-303 | Basics of Commercial Art | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 1 | 2 | 5 | 20 | 25 | 4 hrs. |
| **SEMESTER-4** | | | | | | | | | |
| **Remarks** | **Course Type** | **Course Code** | **Name of the Course** | **Credit** | **Contact Hours/ Week** | **Internal Assessment marks** | **End Term Marks** | **Max. Marks** | **Exam Duration** |
| **Scheme A, B & C** | **CC-4 MCC-6 4 credit** | B23-COA-401 | Advertising Profession | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Scheme B & C** | **MCC-7 4 credit** | B23-COA-402 | Advertising Practice | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Scheme B & C** | **MCC-8 4 credit** | B23-COA-403 | Creative Advertising | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| **Scheme B & C** | **DSE-1 4 credit Select one option** | B23-COA-404 | Poster Design& Calligraphy | 2 | 2 | 15 | 35 | 50, | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-COA-405 | Portrait Photography | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

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# DEPARTMENT OF FINE ARTS, KURUKSHETRA UNIVERSITY, KURUKSHETRA
## Scheme of Examination for Under-Graduate Programme
## Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020
## w.e.f. 2023-24 (in phased manner)
## Subject: Commercial Art

**SEMESTER-5**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A, B & C | CC-5 MCC-9 4 credit | B23-COA-501 | Advertising Media | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | MCC-10 4 credit | B23-COA-502 | Magazine layout | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | DSE-2 4 credit Select one Option | B23-COA-503 | Social Campaign Design | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-COA-504 | Product Campaign Design | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | DSE-3 4 credit Select one Option | B23-COA-505 | Computer Graphics | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-COA-506 | Nature Photography | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

**SEMESTER-6**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A, B & C | CC-6 MCC-11 4 credit | B23-COA-601 | Trademark Design | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | MCC-12 4 credit | B23-COA-602 | Magazine layout & Typography | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | DSE-4 4 credit Select one Option | B23-COA-603 | Illustration | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-COA-604 | Street Photography | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| Scheme B & C | DSE-5 4 credit Select one Option | B23-COA-605 | Image Making | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-COA-606 | Block making &Printing | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

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# DEPARTMENT OF FINE ARTS, KURUKSHETRA UNIVERSITY, KURUKSHETRA

## Scheme of Examination for Under-Graduate Programme
## Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020
## w.e.f. 2023-24 (in phased manner)
## Subject: Commercial Art

**SEMESTER-7 (FOR HONOURS/HONOURS WITH RESEARCH IN COMMERCIAL ART)**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| For Honours in Commercial Art/ Honours with Research in Commercial Art | CC-H1 4 credit | B23-COA-701 | Computer graphics and Photography-I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | CC-H2 4 credit | B23-COA-702 | Social Campaign-I Planning | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | CC-H3 4 credit | B23-COA-703 | Creative Photography-I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | DSE-H1 4 credit Select one Option | B23-COA-704 | Ethics in Advertising-I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-COA-705 | Event Campaign-I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | PC-H1 4 credit | B23-COA-706 | Visualization-Advertising Campaign | 4 | 8 | 30 | 70 | 100 | 6 hrs. |

**SEMESTER-8 (FOR HONOURS IN COMMERCIAL ART)**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Honours in Commercial Art | CC-H4 4 credit | B23-COA-801 | Computer graphics and Photography-II | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | CC-H5 4 credit | B23-COA-802 | Social Campaign-II Planning | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | CC-H6 4 credit | B23-COA-803 | Creative Photography-II | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | DSE-H2 4 credit Select one option | B23-COA-804 | Ethics in Advertising-II | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | | B23-COA-805 | Research Mythology | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | PC-H2 4 credit | B23-COA-806 | Event Campaign-II | 4 | 8 | 30 | 70 | 100 | 6 hrs. |

**ORSEMESTER-8 (FOR HONOURS WITH RESEARCH IN COMMERCIAL ART)**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Honours with Research in Commercial Art | CC-H4 4 credit | B23-COA-801 | Computer graphics and Photography-II | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | CC-H5 4 credit | B23-COA-802 | Social Campaign-II Planning | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| | Project/ Dissertation 12 credit | B23-COA-807 | Project/Dissertation | 8+4 | - | - | - | - | - |



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## COMMERCIAL ART: SEMESTER-I

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A & C | CC-1 MCC-1 4 credit | B23-COA-101 | Fundamental of Arts | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

Level of the course: 100-199

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)**

1. Student will be able to describe Art and different Types of Art .
2. Student will be able to describe different Types of Line and Shape.
3. Student will be able to describe Colour & Colour Theory.
4. Student will be able to describe different Elements of Art.
5. Students will be capable to draw and identifying the Still Objects and different Shapes.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Art:<br>Introduction of Art, Meaning of Art, Definition of Art. Classification of Art, Folk Art etc. | 8 |
| II | Element of art:<br>Line: Horizontal Line, Vertical Line, Diagonal, Spiral Line, Radial Line; Shape: Circular Shape, Rectangular Shape, Square Shape. | 8 |
| III | Elements of art :<br>Colour: Theory of Colour, Primary Colour, Secondary Colour, Tertiary Colour, Hue, Value, Saturation. | 7 |
| IV | Texture, Size, Space ;Tone: Classification of tone: Dark, Middle, light. | 7 |
| V Practical | **PRACTICAL Still life**<br>**Still Life: 01Assignments**<br>**Time: 6 hrs. (2 Session) Paper Size: A3 (11.7x16.5 inches)**<br>**Medium:** Pencil, Crayons, Pastel, Water Colours, Pen and Inks etc.(**Note:** Candidate will have to choose any of the above medium)<br>**Assignments:** Draw a Still Life with arrangements of Still Objects (Black & White or Colored)<br>(Bottle, Tea Pot, Flower Pot, Books, any Fruit etc. (Black & White or Coloured)<br>**Details of course works:**<br>**UNIT-I**<br>**Assignments**<br>Still life 08<br>Sketching 20 | 60 |

**Suggested Evaluation Methods**

**Internal Assessment:**

- **Theory: 15**
  - Class Participation:4
  - Seminar/Presentation/Assignment/Quiz/Class Test etc.:4
  - Mid-Term Exam:7
- **Practicum: 15**
  - Class Participation:5
  - Seminar/Demonstration/Viva-voce/Lab Records etc.: 10
  - Mid-Term Exam: NA

**End Term Examination:**

- **Theory**
  - Written Examination: 35
- **Practicum**
  Practical Examination: 35

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**Learning Resources**

- Commercial Art & Design, by Ray J Matasek
- Design Fundamentals: Notes on Color Theory, by Rose Gonnella, Max Friedman
- Understanding Color, 5th Edition, by Linda Holtzschue
- Design Principles and Design Elements, William Lidwell, Kristina Holden, Jim Butler
- The Elements of Graphic Design, by Alex Whit
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- विज्ञापनकला : एकेश्वरप्रसादहटवाल
- विज्ञापन : अशोकमहाजन

**COMMERCIAL ART: SEMESTER-I**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme C only | MCC-2 4 credit | B23-COA-102 | Introduction to Design | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

Level of the course: 100-199

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)**

1. Student will be able to Understand the meaning of Design .
2. Student will be able to understand the different Types of Design.
3. Student will be able to describe Graphic Design & Historical part of Design.
4. Student will be able to understand the different methods by using Different Material.
5. Students will be capable to draw and identifying the different Designs & Shapes.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Design:<br>General Introduction of Design, Meaning of Design, Definition of Design, Purpose of Design, Functions of Design. | 8 |
| II | Types of Design: Natural Design, Decorative Design, Geometrical Design, Conventional Design, Abstract Design, Graphics Design etc. | 8 |
| III | General Introduction of Graphics Design, Characteristics of Design, History of Design. | 7 |
| IV | Material and Methods: Pencils, Brushes, Papers, Poster Colours, Pencil Colours, Acrylic Colours, Crayons etc. Compressor & Spray Gun, Drawing Board, Sketch Book, Reference File etc. | 7 |
| V Practical | **PRACTICAL 2D & 3D Design**<br><br>**2D & 3D Design: 01Assignments**<br>**Time: 6 hrs. (2 Session) Paper Size: A3 (11.7x16.5 inches)**<br>**Medium:** Pencil, Crayons, Pastel, Water Colours, Pen and Inks etc.(**Note:** Candidate will have to choose any of the above medium)<br>**Assignments:** Prepare a 2D/3D Design (Black & White or Colored<br><br>**Details of course works:**<br>**UNIT-I**<br>**Assignments**<br>2D Design : 06<br>Sketching 20 | 60 |



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| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory: 15**<br>•Class Participation: 4<br>•Seminar/Presentation/Assignment/Quiz/Class Test etc.:4<br>•Mid-Term Exam:7<br>➢ **Practicum: 15**<br>•Class Participation:5<br>•Seminar/Demonstration/Viva-voce/Lab Records etc.: 10<br>•Mid-Term Exam: NA | **End Term Examination:**<br>➢ **Theory**<br>•Written Examination: 35<br>➢ **Practicum**<br>Practical Examination: 35 |

**Learning Resources**

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- विज्ञापन : अशोकमहाजन

**COMMERCIAL ART: SEMESTER-I**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A | CC-M1 2 credit | B23-COA-103 | Introduction of Fine Arts | 1 | 1 | 10 | 20 | 30 | 3 hrs. |
| | | | Practical | 1 | 2 | 5 | 15 | 20 | 4 hrs. |

Level of the course: 100-199

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)**

1. Student will be able to Understand the Fine Arts .
2. Student will be able to understand the different Types of Fine Arts.
3. Student will be able to understand the advancement in Fine Arts.
4. Student will be able to describe various Performing Arts.
5. Students will be capable to create Different Design.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Fine Art:<br>Introduction of Art, Meaning of Art, Definition of Art etc.<br>Introduction of Fine Arts, Meaning of Fine Arts, Definition of Fine Arts etc. | 4 |
| II | Visual Art:<br>Painting, Sculpture, Applied Art, Graphics-Print making, Photography. | 4 |
| III | Digital/Computer Art, Architecture, Textile Design. | 4 |
| IV | Performing Arts:<br>Music, Poetry, Dance, Cinema, Drama. | 3 |



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| | | |
|---|---|---|
| V Practical | **PRACTICAL Object/Product Drawing**<br><br>**Object/Product Drawing: 01Assignments**<br>**Time: 6 hrs. (2 Session) Paper Size: A3 (11.7x16.5 inches)**<br>**Medium:** Pencil, Crayons, Pastel, Water Colours, Pen and Inks etc.(**Note:** Candidate will have to choose any of the above medium)<br><br>**Assignments:** Prepare a Object/Product Drawing (Black & White or Coloured)<br><br>**Details of course works:**<br>**UNIT-I**<br>**Assignments**<br>Object/Product Drawing:05<br>Sketching 20 | 30 |

**Suggested Evaluation Methods**

| Internal Assessment: | End Term Examination: |
|---|---|
| ➢ **Theory: 10**<br>•Class Participation: 2<br>•Seminar/Presentation/Assignment/Quiz/Class Test etc.: 2<br>•Mid-Term Exam: 6<br>➢ **Practicum: 5**<br>•Class Participation: NA<br>•Seminar/Demonstration/Viva-voce/Lab Records etc.: 05<br>•Mid-Term Exam: NA | ➢ **Theory**<br>•Written Examination: 20<br>➢ **Practicum**<br>Practical Examination: 15 |

**Learning Resources**

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- विज्ञापन : अशोकमहाजन

**COMMERCIAL ART: SEMESTER-I**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A & C | MDC-1 3 credit | B23-COA-104 | Basics of Fine Arts-I | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 1 | 2 | 5 | 20 | 25 | 4 hrs. |

Level of the course: 100-199

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)**

1. Student will be able to describe the Fine Arts & Applied Art.
2. Student will be able to describe the different Perspective in Fine Arts.
3. Student will be able to describe the different Principal of Design.
4. Student will be able to describe initial Process of Creativity.
5. Students will be capable to draw Different Figures.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.



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| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Brief History of Art, Fine Arts, Applied /Commercial Art, Scope of Art. | 8 |
| II | Perspective: Types of Perspective:<br>One point Perspective, Two point Perspective, Three point Perspective; Rhythm/ Eye Movement. | 8 |
| III | Principle of Design:<br>Unity/Harmony, Contrast/Dominance, Balance (Types of Balance, Symmetrical Balance, Asymmetrical Balance) | 7 |
| IV | Creativity: Introduction, Meaning and Definition<br>Classification of Creativity ; Planning & Execution | 7 |
| V<br>Practical | **PRACTICAL Figure Drawing**<br><br>**Figure Drawing: 01Assignments**<br>**Time: 6 hrs. (2 Session) Paper Size: A3 (11.7x16.5 inches)**<br>**Medium:** Pencil, Crayons, Pastel, Water Colours, Pen and Inks etc.(**Note:** Candidate will have to choose any of the above medium)<br>**Assignments: Draw any figure i.e. male/female/animal/birds etc**(Black & White or Colored)<br><br>**Details of course works:**<br>**UNIT-I**<br>**Assignments**<br>Figure Drawing:05<br>Sketching 20 | 30 |

**Suggested Evaluation Methods**

| Internal Assessment: | End Term Examination: |
|---|---|
| ➢ **Theory: 15**<br>•Class Participation:4<br>•Seminar/Presentation/Assignment/Quiz/Class Test etc.:4<br>•Mid-Term Exam:7<br>➢ **Practicum: 5**<br>•Seminar/Demonstration/Viva-voce/Lab Records etc.: 5<br>•Mid-Term Exam: NA | ➢ **Theory**<br>•Written Examination: 35<br>➢ **Practicum**<br>Practical Examination: 20 |

**Learning Resources**

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**COMMERCIAL ART: SEMESTER-III**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A, B & C | CC-3 MCC-4 4 credit | B23-COA-301 | Advertising and Society | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

Level of the course: 200-299

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)**

1. Student will be able to describe Different Form of Advertisement .
2. Student will be able to describe Communication Process .
3. Student will be able to describe the Relation of Advertising and Society.
4. Student will be able to describe the Importance of Advertising in the Society.
5. Students will be capable to understand the Poster Design Process.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Advertising as an Art, Advertising as Science, Advertising as an Industry, The role of Art in Advertising. | 8 |
| II | Communication, Publicity, Propaganda, Types of Communication: Verbal & Audio Communication. | 8 |
| III | Advertising and Society – Advertising Business offers Employment, Advertising Promotes Freedom of Press, Information and Freedom of Choice, Advertising Creates Demand and Consequently Sales. | 7 |
| IV | Advertising reduces Selling Cost, Advertising Creates Employment, Advertising establishes Reputation and Prestige, Truth in Advertising, Advertising tries to raise the Standard of Living. | 7 |
| V Practical | **PRACTICAL Mini Poster**<br>**: 01Assignments**<br>**Time: 6 hrs. (2 Session) Paper Size: A3 (11.7x16.5 inches)**<br>**Medium:** Pencil, Crayons, Pastel, Water Colours, Pen and Inks etc.(**Note:** Candidate will have to choose any of the above medium)<br>**Assignments: Design a Mini Social Poster** (Black & White or Colored)<br>**Details of course works:**<br>**Assignments**<br>Social Poster 03<br>Sketching 10 | 60 |

**Suggested Evaluation Methods**

**Internal Assessment:**

- **Theory: 15**
  - Class Participation:4
  - Seminar/Presentation/Assignment/Quiz/Class Test etc.:4
  - Mid-Term Exam:7
- **Practicum: 15**
  - Class Participation:5
  - Seminar/Demonstration/Viva-voce/Lab Records etc.: 10
  - Mid-Term Exam: NA

**End Term Examination:**

- **Theory**
  - Written Examination: 35
- **Practicum**
  Practical Examination: 35

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| Learning Resources |
|---|
| • Commercial Art & Design, by Ray J Matasek<br>• Design Fundamentals: Notes on Color Theory, by Rose Gonnella, Max Friedman<br>• Understanding Color, 5th Edition, by Linda Holtzschue<br>• Design Principles and Design Elements, William Lidwell, Kristina Holden, Jim Butler<br>• The Elements of Graphic Design, by Alex Whit<br>• Foundation of Advertising: S.A Chunnawalla, K.C Sethia.<br>• Advertising and Sales Promotion: S.H.H Kazmi, Satish Batra.<br>• Advertising theory and practice: C.H Sandage, Vernon Fryburger<br>• विज्ञापन 'तकनीक एवंसिद्धान्त' : नरेन्द्र यादव<br>• विज्ञापनडिजाईन : नरेन्द्र यादव<br>• विज्ञापनकला : एकेश्वरप्रसादहटवाल<br>• विज्ञापन : अशोकमहाजन |

**COMMERCIAL ART: SEMESTER-III**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme B & C | MCC-5 4 credit | B23-COA-302 | Advertising Foundation | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

Level of the course: 200-299

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)**

1. Student will be able to describe Origin and Growth of Advertising.
2. Student will be able to describe Different Level of Advertising.
3. Student will be able to describe Different Types of Layout Design.
4. Student will be able to understand various Printing Process.
5. Students will be able to understand the Applications of basic of Logo.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Advertising, Meaning and Definition of Advertising, Origin and Growth of Modern Advertising, History of Advertising in India. | 8 |
| II | Classification of Advertising; International/Global Advertising, National Advertising, Regional and Local Advertising, Functions of Advertising. | 8 |
| III | Elements of Layout Design : Headline, Sub Headline, Slogan, Logo, Illustration, Body Copy, Address Line. | 7 |
| IV | History of Printing; Major Printing Techniques; Letter Press, Gravure/ Intaglio, Lithography, Offset & Silk Screen etc. | 7 |
| V Practical | **PRACTICAL Logo, Visiting Card, Letter Head**<br><br>**Logo: 01Assignments**<br>**Time: 6 hrs. (2 Session) Paper Size: A4**<br>**Medium:** Pencil, Crayons, Pastel, Water Colours, Pen and Inks etc.(**Note:** Candidate will have to choose any of the above medium)<br><br>**Assignments:** Design a Logo (Black & White or Colored)<br><br>**Details of course works:**<br>**Assignments**<br>Logo, Monogram : 08<br><br>Sketching 20 | 60 |



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| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment:**<br>➢ **Theory: 15**<br>•Class Participation:4<br>•Seminar/Presentation/Assignment/Quiz/Class Test etc.:4<br>•Mid-Term Exam:7<br>➢ **Practicum: 15**<br>•Class Participation: 5<br>•Seminar/Demonstration/Viva-voce/Lab Records etc.: 10<br>•Mid-Term Exam: NA | **End Term Examination:**<br>➢ **Theory**<br>•Written Examination: 35<br>➢ **Practicum**<br>Practical Examination: 35 |

**Learning Resources**

- Commercial Art & Design, by Ray J Matasek
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- विज्ञापन : अशोकमहाजन

**COMMERCIAL ART: SEMESTER-III**

| Remarks | Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|---|
| Scheme A, B & C | MDC-3 3 credit | B23-COA-303 | Basics of Commercial art | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| | | | Practical | 1 | 2 | 5 | 20 | 25 | 4 hrs. |

Level of the course: 200-299

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO)**

1. Student will be able to understand the Meaning & Types of Commercial Art.
2. Student will be able to describe Quality of Commercial Artist.
3. Student will be able to describe Scope & Objectives of Commercial Art.
4. Student will be able to understand various process of Design.
5. Students will be able to understand the Creation of Nature Design.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Meaning and Introduction of Commercial Art, Types of Commercial Art: Decorative Art, Interior Decoration, Photography, Screen Printing. | 8 |
| II | Commercial Artist, Qualities of Commercial Artist. Lettering, Craft Work | 8 |
| III | Scope of Commercial Art, Objectives of Commercial Art, Various Material used in Commercial Art and its Techniques, Air Brush Technique, Stippling etc. | 7 |



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| IV | Fashion Design, Jewellery Design, Furniture Design, Costume Design & Lighting Design. | 7 |
| V Practical | **PRACTICAL** Nature Design<br><br>Nature Design: **01Assignments**<br>**Time: 6 hrs. (2 Session) Paper Size: A3**<br>**Medium:** Pencil, Crayons, Pastel, Water Colours, Pen and Inks etc.(**Note:** Candidate will have to choose any of the above medium)<br>**Assignments:** Draw a nature design (Black & White or Colored)<br><br>**Details of course works:**<br>**Assignments**<br>Nature Design : 03<br>Sketching 15 | 30 |

**Suggested Evaluation Methods**

| Internal Assessment: | End Term Examination: |
|---|---|
| ➢ **Theory: 15**<br>•Class Participation:4<br>•Seminar/Presentation/Assignment/Quiz/Class Test etc.:4<br>•Mid-Term Exam:7<br>➢ **Practicum : 5**<br>•Class Participation: 2<br>•Seminar/Demonstration/Viva-voce/Lab Records etc.: 3<br>•Mid-Term Exam: NA | ➢ **Theory**<br>•Written Examination: 35<br>➢ **Practicum**<br>Practical Examination: 20 |

**Learning Resources**

- Commercial Art & Design, by Ray J Matasek
- Design Fundamentals: Notes on Color Theory, by Rose Gonnella, Max Friedman
- Understanding Color, 5th Edition, by Linda Holtzschue
- Design Principles and Design Elements, William Lidwell, Kristina Holden, Jim Butler
- The Elements of Graphic Design, by Alex Whit
- Foundation of Advertising: S.A Chunnawalla, K.C Sethia.
- Advertising and Sales Promotion: S.H.H Kazmi, Satish Batra.
- Advertising theory and practice: C.H Sandage, Vernon Fryburger.
- विज्ञापन 'तकनीक एवंसिद्धान्त' : नरेन्द्र यादव
- विज्ञापनडिजाईन : नरेन्द्र यादव
- विज्ञापनकला : एकेश्वरप्रसादहटवाल
- विज्ञापन : अशोकमहाजन

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**DEPARTMENT OF FINE ARTS, KURUKSHETRA UNIVERSITY, KURUKSHETRA**
**Scheme of Examination for Pool Courses**
**Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020**
**w.e.f. 2023-24 (in phased manner)**

## Skill Enhancement Courses (SEC)

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| SEC-2 | B23-SEC-213 | Miniature Painting | 2 | 2 | 15 | 35 | 50 | 03 hrs. |
| | | Practical | 1 | 2 | 5 | 20 | 25 | 6 hrs. |
| SEC-2 | B23-SEC-219 | Resin Art | 2 | 2 | 15 | 35 | 50 | 03 hrs. |
| | | Practical | 1 | 2 | 5 | 20 | 25 | 3 hrs. |
| SEC-3 | B23-SEC-316 | Rangoli and Mural Designing | 2 | 2 | 15 | 35 | 50 | 03 hrs. |
| | | Practical | 1 | 2 | 5 | 20 | 25 | 6 hrs. |
| SEC-3 | B23-SEC-319 | Calligraphy art | 2 | 2 | 15 | 35 | 50 | 03 hrs. |
| | | Practical | 1 | 2 | 5 | 20 | 25 | 6 hrs. |
| SEC-3 | B23-SEC-320 | Sketch making | 2 | 2 | 15 | 35 | 50 | 03 hrs. |
| | | Practical | 1 | 2 | 5 | 20 | 25 | 3 hrs. |

## Vocational Courses (VOC)

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| VOC-1 | B23-VOC-104 | Block Printing | 2 | 2 | 15 | 35 | 50 | 03 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| VOC-1 | B23-VOC-110 | Interior decoration | 2 | 2 | 15 | 35 | 50 | 03 hrs. |
| | | Practical | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| VOC-1 | B23-VOC-120 | Clay and pot making | 2 | 2 | 15 | 35 | 50 | 03 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| VOC-3 | B23-VOC-311 | Tattoo making | 2 | 2 | 15 | 35 | 50 | 03 hrs. |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |
| VOC-3 | B23-VOC-325 | Wall Painting and Mural | 2 | 2 | 15 | 35 | 50 | 03 hrs |
| | | Practical | 2 | 4 | 15 | 35 | 50 | 06hrs |

## Value Added Courses (VAC)

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| VAC-3 | B23-VAC-311 | Indian Art & Culture | 2 | 2 | 15 | 35 | 50 | 03 hrs |
| VAC-4 | B23-VAC-413 | Art & Appreciation | 2 | 2 | 15 | 35 | 50 | 03 hrs. |

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## SKILL ENHANCEMENT COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| SEC-2 | B23-SEC-213 | Miniature Painting | 2 | 2 | 15 | 35 | 50 | 3hrs. |
| Level of the course: NA | | Practical | 1 | 2 | 5 | 20 | 25 | 6 hrs. |

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO):**

1. To gain a foundational understanding of miniature painting, including its history, techniques, and significance in art.
2. To learn about the various materials, tools, and brushes used in miniature painting.
3. To learn to depict subjects accurately and proportionally within the constraints of a small canvas, including figures, landscapes, and objects.
4. To gain a deeper understanding of composition principles and design elements to create visually engaging and balanced miniature paintings.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Indian Miniature Art<br>Overview of Indian miniature art: history, cultural significance, and regional variations<br>Understanding the themes, symbolism, and storytelling in miniature art<br>Understanding the techniques and conventions of miniature portraits<br>Study of facial proportions, expressions, and capturing likeness<br>Practicing portrait painting techniques using miniature art style<br>Nature and Landscape in Miniature Art | 8 |
| II | Traditional Tools and Materials<br>Introduction to traditional tools used in miniature art: brushes, ink, and pigments<br>Understanding different types of paper and surfaces used in miniature painting<br>Overview of natural pigments and their preparation | 8 |
| III | Rajput and Pahari Miniature Art<br>Understanding the unique characteristics of Rajput miniature art<br>Study of stylized figures, elaborate backgrounds, and vibrant color palettes<br>Practicing Rajput miniature painting techniques: delicate line work, stippling, and detailing | 7 |
| IV | Mughal Miniature Art<br>Exploring the aesthetics and techniques of Mughal miniature art<br>Study of composition, figure drawing, and facial features<br>Practicing Mughal miniature painting techniques: underpainting, layering, and glazing. | 7 |
| V | Practical:<br>Exploring the depiction of nature and landscapes in miniature paintings<br>Study of trees, flowers, animals, and natural elements<br>Practicing miniature landscape techniques: creating depth, texture, and atmospheric perspective<br>1. No. of Assignments: 5 | 30 |

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| Suggested Evaluation Methods | |
|---|---|
| **Internal Assessment: 15**<br>➢ **Theory**<br>• Class Participation: 04<br>• Seminar/presentation/assignment/quiz/class test etc.: 04<br>• Mid-Term Exam: 07 | **End Term Examination: 35**<br>➢ **Theory**<br>• Written Examination |
| ➢ **Practicum: 05**<br>• Class Participation: 03<br>• Seminar/presentation/assignment/quiz/classtestetc.:02<br>• Mid-Term Exam | **Practicum: 20**<br>➢ Practical examination |

**Learning Resources**

**SUGGESTED READINGS:**


1. 1. "Indian Miniature Paintings: Collection of the National Museum" by Jyotindra Jain and Sanjeev Kumar
2. "The Painted World of the Warlis: Art and Ritual of the Warli Tribes of Maharashtra" by Yashodhara Dalmia
3. "The Art of Indian Miniature Painting" by M. S. Randhawa
4. "Indian Miniature Painting: The Collection of Edwin Binney, 3rd" by Stephen Markel
5. "Indian Miniature Painting: Contemporary Artists and their Sources" by Yashodhara Dalmia
6. "Indian Miniatures: A Journey through the Indian Masters" by Ariana Polo
7. "Indian Miniature Painting and Contemporary Art: The Prince of Wales visit" by O P Sharma
8. "Indian Miniature Paintings: From 15th to 19th Century" by Dr. D. Chandra Bomma
9. "Rajput Painting: Romantic, Divine and Courtly Art from India" by Roda Ahluwalia
10. "Indian Pahari Miniature Painting" by W. G. Archer


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## SKILL ENHANCEMENT COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| SEC-2 | B23-SEC-219 | Resin Art | 2 | 2 | 15 | 35 | 50 | 3hrs. |
| Level of the course: NA | | Practical | 1 | 2 | 5 | 20 | 25 | 3 hrs. |

Pre-requisite for the course (if any): NA

**Course Learning Outcomes(CLO):**

1. Understand the basic concepts, properties, and types of resin used in art, including epoxy and polyurethane resins.
2. Familiarize yourself with the various materials and tools required for resin art, such as mixing cups, pigments, additives, molds, and substrates
3. Learn fundamental techniques, including mixing resin and hardener accurately, achieving consistent viscosity, and preventing air bubbles in the resin mixture.
4. Develop skills in layering resin to create depth and dimension in your artworks, and experiment with embedding objects within layers for added visual interest.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Resin Art<br>Understanding epoxy resin: properties, types, and uses<br>Safety precautions and handling guidelines<br>Introduction to resin art techniques and styles<br>Color Theory and Pigments<br>Basics of color theory and its application in resin art<br>Different types of pigments and their effects on resin<br>Color mixing techniques and creating custom color palettes | 8 |
| II | Choosing the right substrate for resin art<br>Surface preparation and priming techniques<br>Exploring alternative canvas options<br>Pouring and Layering Techniques<br>Introduction to various pouring techniques: dirty pour, flip cup, swipe, etc.<br>Layering resin and creating depth and dimension<br>Working with additives: alcohol inks, acrylics, and glitters | 8 |
| III | Creating Cells and Effects<br>Understanding the science behind cell formation<br>Techniques for creating cells: torching, blowing, and manipulating the resin<br>Creating unique effects: lacing, webbing, and marble effects<br>Embedding Objects and Collage<br>Incorporating objects into resin art: dried flowers, shells, etc.<br>Creating collages with different materials<br>Techniques for proper embedding and preserving objects | 7 |
| IV | Finishing and Curing<br>Sanding and polishing techniques for a smooth and glossy finish<br>Applying protective coatings: varnish and UV-resistant finishes<br>Proper curing and drying methods<br>Advanced Techniques and Project Showcase<br>Advanced resin art techniques: geode art, resin jewelry, and resin petri dishes<br>Showcasing your resin art projects and discussing individual progress<br>Tips for photographing and presenting resin art | 7 |

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| | | |
|---|---|---|
| V | Practical:<br>Number of assignments- 10 | 30 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment: 15**<br>➢ **Theory**<br>• Class Participation: 04<br>• Seminar/presentation/assignment/quiz/class test etc.: 04<br>• Mid-Term Exam: 07<br><br>**Practicum: 05**<br>• Class Participation: 03<br>• Seminar/presentation/assignment/quiz/class test etc.:02<br>Mid-Term Exam | **End Term Examination:**<br>➢ **Theory: 35**<br>• Written Examination<br><br>**Practicum: 20**<br>➢ Practical examination |

**Learning Resources**

**SUGGESTED READINGS:**


1 "Resin Art: Basics and Beyond" by Kathryn Joachim
2. "The Complete Resin Handbook: A Guide to the Resins That Create Art" by Peggi L. Rodgers
3. "Resin Alchemy: Innovative Techniques for Mixed-Media and Jewelry Artists" by Susan Lenart Kazmer
4. "Resin Art: Ideas, Techniques, and Inspiration for Creating Art with Epoxy" by Sherri Haab
5. "Mastering Resin" by Nicholas Argyros
6. "The Art of Resin Jewelry: Layering, Casting, and Mixed Media Techniques for Creating Vintage to Contemporary Designs" by Sherri Haab
7. "Resin Jewelry Making" by Rebecca L. Burns
8. "Introduction to Resin Art: A Contemporary Creative Journey" by Jasmina Groselj
9. "Resin Art Techniques: Explore the Possibilities of Resin and Create Unique Artwork" by Sallieann Harrison
10. "Resin Crafts: 35 Creative and Easy-to-Make Projects for the Home and Garden" by Juliet Bawden


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## SKILL ENHANCEMENT COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| SEC-3 | B23-SEC-316 | Mural Rangoli Designing | 2 | 2 | 15 | 35 | 50 | 3hrs. |
| Level of the course: NA | | Practical | 1 | 2 | 5 | 20 | 25 | 6 hrs. |

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO):**

1. To understand the cultural and historical significance of Rangoli in various cultures and learn about its traditional motifs and patterns
2. To develop the ability to draw freehand Rangoli designs and experiment with basic floral, abstract, and symmetrical patterns.
3. To understand the history and evolution of mural art, exploring its cultural, social, and political significance.
4. To learn the fundamentals of sketching and composing mural designs, considering scale, perspective, and visual storytelling.
5. To understand the importance of preparing the mural surface, including cleaning, priming, and addressing any structural issues.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Rangoli Art<br>Overview of rangoli art: history, cultural significance, and regional variations<br>Understanding the symbolism and spiritual aspects of rangoli designs<br>Introduction to different materials and techniques used in rangoli art | 8 |
| II | Study of traditional rangoli patterns: geometric, floral, and symbolic motifs, Exploring traditional motifs and their meanings.<br>Basic patterns and motifs using chalk or rice flour. | 8 |
| III | Introduction to Mural Art<br>Overview of Mural art: history, cultural significance, and regional variations.<br>Introduction to different types, materials and techniques used in Mural | 7 |
| IV | Study of famous Ancient Murals and Modern Mural and their Artists | 7 |
| V | Practical:Dot grid rangoli designs (kolam)<br>Theme-based Rangoli Designs<br>Rangoli with Flowers and Petals<br>Practice of Mural on Board / paper.<br><br>No. of Assignments: 2 Mural, 2 Rangoli | 30 |

**Suggested Evaluation Methods**

**Internal Assessment: 15**

- **Theory**
  - Class Participation: 04
  - Seminar/presentation/assignment/quiz/class test etc.: 04
  - Mid-Term Exam: 07

**Practicum: 05**

- Class Participation:03
- Seminar/presentation/assignment/quiz/class test etc.:02
  Mid-Term Exam

**End Term Examination:**

- **Theory: 35**
  - Written Examination

**Practicum: 20**

- Practical examination

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| Learning Resources |
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| **SUGGESTED READINGS:**<br>1. "Rangoli: An Indian Art Activity Book" by Anuradha Ananth<br>2."The Art of Rangoli" by Tanvi Shah<br>3."Rangoli: Discovering the Art of Indian Decoration" by Shobha Vohra<br>4."Rangoli: Indian Art of Drawing" by Sonu Sood<br>5. "Rangoli: A Traditional Indian Art" by Manisha Pathak-Shelat<br>6."Rangoli: A Colorful Kaleidoscope of Indian Art" by Anurag Mehta<br>7. "The Art of Rangoli: Creative Patterns and Designs for Artists of All Ages" by Sunita Nandha |

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## SKILL ENHANCEMENT COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| SEC-3 | B23-SEC-319 | Calligraphy art | 2 | 2 | 15 | 35 | 50 | 3 hrs. |
| Level of the course: NA | | Practical | 1 | 2 | 5 | 20 | 25 | 6 hrs. |

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO):**

1. Understand the history and significance of calligraphy as an art form.
2. Familiarize themselves with different calligraphic styles and scripts.
3. Demonstrate proficiency in using various calligraphy tools and materials.
4. Develop control and precision in forming letterforms and strokes.
5. Create compositions and designs using calligraphy techniques.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | History and cultural significance of calligraphy<br>Overview of different calligraphy styles and scripts<br>Introduction to calligraphy tools and materials and Basic Letter forms and Strokes | 8 |
| II | Understanding pen angles and pressure control<br>Practicing basic strokes and letterforms in a foundational style<br>Expanding Techniques<br>Exploring variations in letterforms<br>Introduction to flourishing and embellishments | 8 |
| III | Contemporary Scripts<br>Introduction to modern calligraphy scripts (e.g., Copperplate, Spencerian)<br>Practicing letterforms and word compositions<br>Gothic and Blackletter Scripts, Learning the characteristics of gothic and blackletter scripts<br>Practicing uppercase and lowercase letterforms | 7 |
| IV | Italic and Chancery Scripts.<br>Understanding the structure and style of italic and chancery scripts.<br>Practicing letterforms and word compositions. | 7 |
| V | Practical:<br>Creating Compositions: Combining letterforms into words, phrases, and quotes<br>Exploring layout and design principles in calligraphy<br>Applying Calligraphy to Different Surfaces: Calligraphy on paper, envelopes, and cards<br>Developing Personal Style: Experimenting with different variations and modifications | 30 |

**Suggested Evaluation Methods**

**Internal Assessment: 15**

- **Theory**
  - Class Participation: 04
  - Seminar/presentation/assignment/quiz/class test etc.: 04
  - Mid-Term Exam: 07

**Practicum: 05**

- Class Participation: 03
- Seminar/presentation/assignment/quiz/class test etc.: 02
  Mid-TermExam

**End Term Examination: 35**

- **Theory**
  - Written Examination

**Practicum:20**

- Practical examination

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| Learning Resources |
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| **SUGGESTED READINGS:**<br>1. "The Calligrapher's Bible: 100 Complete Alphabets and How to Draw Them" by David Harris<br>2. "The Art of Calligraphy: A Practical Guide to the Skills and Techniques" by David Harris.<br>3. "The Calligrapher's Studio" by Christopher Calderhead<br>4. "The History and Technique of Lettering" by Alexander Nesbitt<br>5. "Mastering Copperplate Calligraphy: A Step-by-Step Manual" by Eleanor Winters<br>6. "The Complete Book of Calligraphy & Lettering" by Cari Ferraro and Eugene Metcalf |

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## SKILL ENHANCEMENT COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| SEC-3 | B23-SEC-320 | Sketch making | 2 | 2 | 15 | 35 | 50 | 3hrs. |
| Level of the course: NA | | Practical | 1 | 2 | 5 | 20 | 25 | 3 hrs. |

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO):**

1. To introduce students to the fundamentals of sketch making as a crucial aspect of the creative process.
2. Through a series of practical exercises, students will learn various sketching techniques, explore different mediums, and develop their observational and conceptual skills.
3. The course aims to equip students with the ability to use sketching as a tool for ideation, visual exploration, and problem-solving in their artistic endeavours.
4. Demonstrate proficiency in translating abstract ideas into visual representations, using various sketching techniques.
5. Exhibit the capability to seamlessly integrate sketching into their creative workflow.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Sketching Fundamentals<br>- Overview of sketching as an essential tool for artists<br>- Understanding the purpose and types of sketches | 8 |
| II | Exploring different sketching mediums (pencil, charcoal, ink, etc.)<br>- Basic sketching techniques: line, shape, form, shading, and perspective<br>- Developing observational skills through still-life sketches | 8 |
| III | Exploring Sketching Styles and Subjects<br>- Understanding different sketching styles and their significance (realism, impressionism, abstraction, etc.) | 7 |
| IV | Using sketches to explore composition and visual storytelling<br>Concept sketching for characters, environments, and narratives | 7 |
| V | Practical:<br>Landscape sketching, Figure sketching (gestures, anatomy, and proportions)<br>Portraiture sketching | 30 |

**Suggested Evaluation Methods**

**Internal Assessment: 15**

- **Theory**
  - Class Participation: 04
  - Seminar/presentation/assignment/quiz/class test etc.: 04
  - Mid-Term Exam: 07

**Practicum: 05**

- Class Participation: 03
- Seminar/presentation/assignment/quiz/class test etc.: 02
  Mid-Term Exam

**End Term Examination:35**

- **Theory**
  - Written Examination

**Practicum: 20**

- Practical examination

**Learning Resources**

**SUGGESTED READINGS:**


1. "The Artist's Complete Guide to Drawing the Head" by William Maughan
2. "Figure Drawing for Artists: Making Every Mark Count" by Steve Huston
3. "An Atlas of Anatomy for Artists" by Fritz Schider, Max Auerbach, and Adolf K. Placzek
4. "Drawing the Head and Hands" by Andrew Loomis
5. "Portrait Drawing: A Step-by-Step Art Instruction Book" by Wendon Blake


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## VOCATIONAL COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| VOC-1 | B23-VOC-104 | Block Printing | 2 | 2 | 15 | 35 | 50 | 3hrs. |
| Level of the course: NA | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

Pre-requisite for the course (if any):NA

**Course Learning Outcomes(CLO):**

After completing this course, the learner will be able to:

1. Understand to the techniques, tools, and materials involved in block making and printing.
2. learn about different types of blocks, carving methods, ink preparation, and printing processes.
3. Develop the skills necessary to create unique block prints and explore your creativity in this versatile medium
4. Be self- dependent and self employed by creating block making and printing.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Block Making and Printing<br>Overview of block making and printing: history, cultural significance, and contemporary applications<br>Introduction to different types of blocks: wood, linoleum, and rubber<br>Understanding the tools and materials used in block making and printing | 08 |
| II | Design and Composition<br>Exploring the principles of design and composition in block printing<br>Study of positive and negative space, balance, and rhythm<br>Developing design concepts and sketches for block prints | 08 |
| III | Carving Techniques: Wood Blocks<br>Study of basic carving tools, safety precautions, and techniques<br>Carving Techniques: Linoleum Blocks<br>Study of linoleum block characteristics, tools, and techniques<br>Carving Techniques: Rubber Blocks<br>Study of rubber block characteristics, tools, and techniques | 07 |
| IV | Ink Preparation and Application<br>Exploring different types of printing inks: water-based, oil-based, and fabric inks<br>Techniques for ink mixing, consistency, and application<br>Printing Processes<br>Introduction to different printing methods: hand printing, press printing, and block registration<br>Study of printing techniques, pressure control, and multiple color printing | 07 |
| V | Practical: No. of Assignments: 4 (Wood, Lino, Rubber) | 60 |

**Suggested Evaluation Methods**

| Internal Assessment:15 | End Term Examination: 35 |
|---|---|
| ➢ **Theory**<br>• Class Participation: 04<br>• Seminar/presentation/assignment/quiz/class test etc.: 04<br>• Mid-Term Exam: 07 | |

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|---|---|
| ➢ **Practicum :15**<br>• Class Participation: 10<br>• Seminar/Demonstration/Viva-voce/Lab records etc.: 5<br>• Mid-Term Exam: | **Practicum:35**<br>➢ Practical examination |

**Learning Resources**

**SUGGESTED READINGS:**


1. "Block Printing Techniques for Linoleum and Wood" by Sandy Allison
2. "Print, Pattern, Make, and Design" by Jane Foster
3. "Block Print Magic: The Essential Guide to Designing, Carving, and Taking Your Artwork Further with Relief Printing" by Emily Louise Howard
4. "The Complete Guide to Decorative Block Printing" by Jackie Barrass
5. "The Block Printed Textiles of India: Imprints of Culture" by Eiluned Edwards
6. "Hand Printing from Nature: Create Unique Prints for Fabric, Paper, and Other Surfaces Using Natural and Found Materials" by Laura Donnelly Bethmann
7. "Block Printing for Beginners: A Beginner's Guide to Block Printing" by Eliza Gregory
8. "Printmaking: A Complete Guide to Materials & Processes" by Beth Grabowski and Bill Fick
9. "The Complete Book of Printmaking" by Stephen Westcott
10. "Block Printing: Techniques for Linoleum and Wood" by Fiona Stolze


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## VOCATIONAL COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| VOC-1 | B23-VOC-110 | Interior decoration | 2 | 2 | 15 | 35 | 50 | 3hrs. |
| Level of the course: NA | | Practical | 2 | 2 | 15 | 35 | 50 | 3 hrs. |

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO):**

1. To demonstrate a proficient understanding of interior decoration principles, including the effective use of space, color, form, and materials.
2. To enhance their ability to visually communicate design ideas through mood boards, sample boards, and comprehensive presentations.
3. To recognize the importance of cultural sensitivity and the impact of design choices on users' experiences.
4. Students will gain experience working collaboratively on projects and develop interpersonal skills essential for effective teamwork.
5. To equip students with a well-rounded skill set, enabling them to embark on careers as competent and creative interior decorators within the broader context of the fine art industry.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Interior Decoration<br>- Overview of Interior Decoration: Definition, history, and significance.<br>- Elements of Interior Design: Understanding space, form, color, texture, and light.<br>- Principles of Interior Design: Balance, harmony, rhythm, proportion, and emphasis. | 8 |
| II | Space Planning and Design<br>- Space Analysis: Assessing functional requirements, user needs, and building codes.<br>- Floor Plans and Layouts: Creating effective and efficient room layouts.<br>- Furniture Selection and Placement: Understanding ergonomics and visual aesthetics. | 8 |
| III | Interior Decoration Techniques<br>- Wall Treatments: Paint, wallpaper, murals, and decorative panels.<br>- Window Dressings: Curtains, blinds, shades, and draperies.<br>- Lighting Design: Types of lighting, creating ambiance, and accentuating focal points.<br>- Decorative Accessories: Selecting and arranging art, sculptures, and decorative objects.<br>-Flooring and Carpeting: Understanding different flooring materials and their applications. | 7 |
| IV | Interior Decoration Project and Presentation<br>- Research and Concept Development: Choosing a project theme and creating a concept. | 7 |
| V | Practical:<br>Preparing and delivering a comprehensive interior decoration project. | 60 |

**Suggested Evaluation Methods**

**Internal Assessment: 15**

- **Theory**
  - Class Participation: 04
  - Seminar/presentation/assignment/quiz/class test etc.: 04
  - Mid-Term Exam: 07

**Practicum:15**

- Class Participation:10
- Seminar/presentation/assignment/quiz/class test etc.: 05
  Mid-Term Exam

**End Term Examination: 35**

- **Theory**
  - Written Examination

**Practicum:35**

- Practical examination

**Learning Resources**

**SUGGESTED READINGS:**

1. "The Interior Design Reference & Specification Book: Everything Interior Designers Need to Know Every Day" by Chris Grimley, Mimi Love, and Linda O'Shea
2. "Elements of Style: Designing a Home & a Life" by Erin Gates
3. "Domino: The Book of Decorating: A Room-by-Room Guide to Creating a Home That Makes You Happy" by Deborah Needleman, Sara Ruffin Costello, and Dara Caponigro.
4. Styled: Secrets for Arranging Rooms, from Tabletops to Bookshelves" by Emily Henderson

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## VOCATIONAL COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| VOC-1 | B23-VOC-120 | Clay and pot making | 2 | 2 | 15 | 35 | 50 | 3hrs. |
| Level of the course: NA | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO):**

1. Students will be able to apply various pottery techniques, including hand-building and wheel throwing, to create functional and decorative pottery
2. Students will gain a comprehensive understanding of the historical and cultural significance of pottery.
3. develop the ability to analyse and evaluate pottery artworks, considering both technical aspects and conceptual depth.
4. students will be encouraged to explore their creativity and develop a personal style in their pottery creations.
5. They will learn to use the medium of clay as a means of self-expression, developing unique and innovative approaches to their artistic practice.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Clay and Pottery<br>- Understanding the properties of clay: types, characteristics, and preparation.<br>- Introduction to basic tools and equipment for pottery-making.<br>- Techniques of hand-building: pinch, coil, and slab methods. | 8 |
| II | Basic tools and equipment used in pottery<br>- Analyzing the influence of pottery in art, culture, and everyday life.<br>- Contemporary ceramic artists and their contributions. | 8 |
| III | Advanced Pottery Techniques<br>- Exploring complex forms: lidded vessels, handles, and spouts.<br>- Surface decoration techniques: Carving, sgraffito, slip trailing, and underglaze application.<br>-Understanding kilns and the firing process: bisque and glaze firing. | 7 |
| IV | Thematic pottery projects inspired by specific cultures or historical periods.<br>- Critiques and discussions on the significance of pottery in contemporary art. | 7 |
| V | Practical:<br>Creating simple forms and vessels through hand-building exercises.<br>Creating basic surface textures and patterns | 60 |

**Suggested Evaluation Methods**

**Internal Assessment: 15**

- **Theory**
  - Class Participation: 04
  - Seminar/presentation/assignment/quiz/class test etc.: 04
  - Mid-Term Exam: 07

**Practicum: 15**

- Class Participation:10
- Seminar/presentation/assignment/quiz/class test etc.: 05
  Mid-Term Exam

**End Term Examination: 35**

- **Theory**
  - Written Examination

**Practicum:35**

- Practical examination

**Learning Resources**

**SUGGESTED READINGS:**


1. "The Complete Potter's Handbook" by Tony Birks and Steve Mattison
2. "The Essential Guide to Mold Making & Slip Casting" by Andrew Martin.
3. "Mastering the Potter's Wheel: Techniques, Tips, and Tricks for Potters" by Ben Carter.
4. "The Potters Dictionary of Materials and Techniques" by Frank Hamer.


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## VOCATIONAL COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| VOC-3 | B23-VOC-311 | Tattoo making | 2 | 2 | 15 | 35 | 50 | 3hrs. |
| Level of the course: NA | | Practical | 2 | 4 | 15 | 35 | 50 | 6 hrs. |

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO):**

1. Course is design to introduce students to the fundamentals of tattoo art.
2. To provide a solid foundation for those interested in pursuing career as a tattoo artist.
3. To enable students to gain confidence and develop skill needed to create professional tattoos.
4. To develop an understanding of design principles and create balance and visually appealing tattoos.
5. Develop knowledge regarding ethical consideration relating to tattooing.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Tattoo Art.<br>Understanding Skin anatomy: Layers, texture and consideration for tattooing. | 8 |
| II | Tattoo equipment: Introduction to Tattoo machines needles and other tools.<br>Sterilization and sanitation: Importance of hygiene and maintaining a clean workspace. | 8 |
| III | Stenciling and transfer: Methods for transferring designs<br>Color theory for tattoo making. | 7 |
| IV | Skin preparation: Techniques for properly preparing the skin before tattooing.<br>Tattoo Safety: Precautions and measures to infection. | 7 |
| V | Practical:<br>1. Practicing basic shading: Hands on exercising to develop shading skills.<br>2. Practicing of basic symbols and shapes with needle. | 60 |

**Suggested Evaluation Methods**

| | |
|---|---|
| **Internal Assessment: 15**<br>➢ **Theory**<br>• Class Participation: 04<br>• Seminar/presentation/assignment/quiz/class test etc.: 04<br>• Mid-Term Exam: 07 | **End Term Examination: 35**<br>➢ **Theory**<br>• Written Examination |
| ➢ **Practicum:15**<br>• Class Participation: 10<br>• Seminar/presentation/assignment/quiz/class test etc.: 05<br>• Mid-Term Exam | **Practicum: 35**<br>➢ Practical examination |

**Learning Resources**

**SUGGESTED READINGS:**


1. "The Tattoo History Source Book: An Illustrated History of Body Art" by Steve Gilbert
2. "Tattoo Machine: Tall Tales, True Stories, and My Life in Ink" by Jeff Johnson
3. "Tattooing the World: Pacific Designs in Print and Skin" by Juniper Ellis
4. "The Tattoo Encyclopedia: A Guide to Choosing Your Tattoo" by Terisa Green
5. "Tattooing A to Z: A Guide to Successful Tattooing" by Huck Spaulding


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## VOCATIONAL COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| VOC-3 | B23-VOC-325 | Wall Painting and Murals | 2 | 2 | 15 | 35 | 50 | 03hrs |
| Level of the course: NA | | Practical | 2 | 4 | 15 | 35 | 50 | 06hrs |

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO):**

After completing this course, the learner will be able to:

1. The techniques, tools, and concepts involved in creating stunning wall paintings and murals.
2. Will learn about the history of mural art, surface preparation, design composition, color theory, and various painting techniques.
3. Feel pride about Indian Art Heritage and ancient mural techniques.
4. Be self-dependent and self employed by creating wall painting and mural for others.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to wall painting and mural art: history, cultural significance, and contemporary applications.<br>Understanding the elements and principles of design in mural art.<br>Introduction to various mural styles and techniques. | 8 |
| II | Understanding different wall surfaces and their preparation requirements.<br>Techniques for cleaning, repairing, and priming walls for painting.<br>Exploring different types of primers and sealants.<br>Developing a design concept for a wall painting or mural.<br>Techniques for creating preliminary sketches, layouts, and compositions.<br>Study of scale and proportion in mural art. | 8 |
| III | Incorporating Narrative and Symbolism.<br>Exploring storytelling and symbolism in mural art.<br>Techniques for incorporating narrative elements and symbolic imagery.<br>Developing a narrative or theme for a mural project.<br>Study of ancient murals and latest famous murals of India | 7 |
| IV | Introduction to perspective and creating depth in murals.<br>Study of vanishing points, horizon lines, and foreshortening.<br>Understanding the challenges and considerations of working on large-scale murals.<br>Techniques for scaling up designs and maintaining proportion. | 7 |
| V | No. of Assignments: 2 | 60 |

**Suggested Evaluation Methods**

| Internal Assessment: 15 | End Term Examination: 35 |
|---|---|
| ➢ **Theory**<br>• Class Participation: 04<br>• Seminar/presentation/assignment/quiz/class test etc.: 04<br>• Mid-Term Exam: 07 | ➢ **Theory**<br>• Written Examination -35 |

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| | |
|---|---|
| ➢ **Practicum: 15**<br>• Class Participation: 5<br>• Seminar/presentation/assignment/quiz/class test etc.: 10<br>• Mid-Term Exam : | **Practicum**<br>➢ Practical examination - 35 |

**Learning Resources**

**SUGGESTED READINGS:**

1. "History of Indian Wall Painting" by Pupul Jayakar
2. "Fresco Painting: Techniques for Muralists and Decorative Painters" by Alwyn Crawshaw
3. "The Murals of Tibet" by Thomas Laird and Robert A. F. Thurman
4. "Mural Art: Wall Paintings in Flanders and the Northern Netherlands" by Max J. Friedlander
5. "Mural Paintings of Ajanta Caves" by Dieter Schlingloff
6. "From Assyria to Iberia: Crossing Continents: Wall Paintings from the Round City of Bagdad" by Dr. Stephanie Dalley
7. "Maya Art and Architecture (World of Art)" by Mary Ellen Miller
8. "Mexican Muralism: A Critical History" by Alejandro Anreus, Robin Adele Greeley, and Leonard Folgarait
9. "Mural Art: Murals on Huge Public Places Around The World" by Andy Simpson and Sarah Pratt
10. "The Awakened Eye: A Companion Guide to the Art of Mural Painting" by Brent R. Anderson

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## VALUE ADDED COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| VAC-3 | B23-VAC-311 | Indian Art & Culture | 2 | 2 | 15 | 35 | 50 | 03 hrs |

Level of the course: NA

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO):**

After completing this course, the learner will be able to:

1. Study of Indian art to understand our cultural heritage.
2. Enhances the knowledge of development in art & tradition.
3. Understanding the Value of Indian scriptures & Vedic philosophies.
4. Understand the Development of different ideologies & influences in Indian Art

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Indian Art and Culture:<br>Indus Valley Civilization:<br>Art and architecture of the Indus Valley Civilization<br>Significance of various artifacts and structures | 8 |
| II | Introduction to Early Indian Art:<br>Classical Indian Art and Architecture<br>Introduction to Mauryan and Post-Mauryan Art:<br>Introduction to Gupta Period | 8 |
| III | Introduction to Rajput, Pahari and Mughal Art:<br>Mughal miniature paintings and Indo-Islamic architecture | 7 |
| IV | Tribal Art of India:<br>Diversity and uniqueness of Indian tribal art<br>Styles and motifs in Gond, Bhil, and Warli tribal art<br>Ritualistic and spiritual aspects of tribal art<br>Introduction to contemporary and Modern Indian Art: | 7 |
| | **Total Hours** | **30** |

**Suggested Evaluation Methods**

**Internal Assessment:15**

- **Theory**
  - Class Participation: 04
  - Seminar/presentation/assignment/quiz/class test etc.: 04
  - Mid-Term Exam: 07

**End Term Examination: 35**

- **Theory**
  - Written Examination

**Learning Resources**

**SUGGESTED READINGS:**


1. "The Art and Architecture of the Indian Subcontinent" by J.C. Harle
2. "Indian Art" by Vidya Dehejia
3. "The Indus Civilization: A Contemporary Perspective" edited by Gregory L. Possehl"Indian Folk and Tribal Paintings" by Jagdish Mittal
4. "The Art of India: Traditions of Indian Folk Art" by Kapila Vatsyayan
5. "Indian Contemporary Art: Post Independence" by Yashodhara Dalmia
6. "Indian Architecture: Buddist and Hindu Period" by Percy Brown
7. "The Sculpture of Early Medieval Rajasthan" by Cynthia Packert
8. "Indian Miniature Painting" by AnjanChakraverty


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## VALUE ADDED COURSE

| Course Type | Course Code | Name of the Course | Credit | Contact Hours/ Week | Internal Assessment marks | End Term Marks | Max. Marks | Exam Duration |
|---|---|---|---|---|---|---|---|---|
| VAC-4 | B23-VAC-413 | Art Appreciation | 2 | 2 | 15 | 35 | 50 | 3hrs. |

Level of the course: NA

Pre-requisite for the course (if any): NA

**Course Learning Outcomes (CLO):**

After completing this course, the learner will be able to:

1. An understanding of basic principle of art &color, concept, media and formats, and the ability to apply them to a specific aesthetic intent.
2. Knowledge of different element of Arts studies and continuing throughout the degree program towards the development of advance capabilities.
3. Understanding the basic fundamentals of arts with its merits and demerits
4. Progress towards developing the knowledge of consistent, personal direction and style.

**Instructions for Paper-Setter**

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No.1 and four more questions selecting one question from each unit.

| UNIT | TOPICS | CONTACT HOURS |
|---|---|---|
| I | Introduction to Art<br>Understanding the Definition and Purpose of Art<br>Elements of Art: Line, Shape, Form, Color, Texture, Value, and Space<br>Principles of Art: Balance, Contrast, Emphasis, Movement, Pattern, Rhythm, and Unity<br>Different forms of Art: Painting, Sculpture, Architecture, Photography | 8 |
| II | Art and Society<br>Art as a Reflection of Culture and Society<br>Political and Social Contexts in Art<br>Art and Identity: Gender, Race, and Ethnicity<br>Art and Power: Propaganda and Protest | 8 |
| III | Art and Technology: Digital Art and Virtual Reality<br>Art and Globalization | 7 |
| IV | Art Appreciation and Critique<br>Developing Critical Thinking Skills in Art Analysis<br>Art Criticism and Art Reviews<br>Understanding Art Galleries and Museums | 7 |
| | **Total Hours** | 30 |

**Suggested Evaluation Methods**

| Internal Assessment:15 | End Term Examination: 35 |
|---|---|
| ➢ **Theory**<br>• Class Participation: 04<br>• Seminar/presentation/assignment/quiz/class test etc.: 04<br>• Mid-Term Exam: 07 | ➢ **Theory**<br>• Written Examination |

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**Learning Resources**

**SUGGESTED READINGS:**

"Art and Visual Perception: A Psychology of the Creative Eye" by Rudolf Arnheim
"Art in Theory 1900-1990: An Anthology of Changing Ideas" edited by Charles Harrison and Paul Wood
"Ways of Curating" by Hans Ulrich Obrist
"Art and Fear: Observations on the Perils (and Rewards) of Artmaking" by David Bayles and Ted Orland
"Art as Therapy" by Alain de Botton and John Armstrong
Art and Visual Culture: A Reader" edited by AngelikiLymberopoulou and Rembrandt Duits
"The Social History of Art" by Arnold Hauser
"Art and Revolution" by John Berger
"Art and Today" by Eleanor Heartney, Helaine Posner, Nancy Princenthal, and Sue Scott
"The Culture of Curating and the Curating of Culture(s)" by Paul O'Neill
"The Visual Arts: A History" by Hugh Honour and John Fleming
"Art Since 1900: Modernism, Antimodernism, Postmodernism" by Hal Foster, Rosalind Krauss, Yve-Alain Bois, and Benjamin H. D. Buchloh
"Art in Theory, 1900-2000: An Anthology of Changing Ideas" by Charles Harrison and Paul Wood
"Art: A Brief History" by Marilyn Stokstad and Michael W. Cothren
"A World History of Art" by Hugh Honour and John Fleming
The Story of Art" by E.H. Gombrich
"Ways of Seeing" by John Berger
"Art: A World History" by Elke Linda Buchholz
"Art Fundamentals: Theory and Practice" by Ocvirk, Stinson, Wigg, and Bone
"Living with Art" by Mark Getlein

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REVISED SCHEME w.e.f 2023-24 (Sem. II & III)

Annexure to Item 10(39)

## M.Ed Spl. Edu. (V.I.)

| Existing | | | | | | Amended (approved by PG BoS) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Title | Credits | Internal Marks | External Marks | Total Marks | Duration of Exam | Course Title | Credits | Internal Marks | External Marks | Total Marks | Duration of Exam |
| OESS-I<br>MSE OE-01 | 2 | 10 | 40 | 50 | Two hours | OESS-I<br>MSE OE-01 | 2 | ------- | 50 | 50 | Two hours |
| MSE OE-02 | 2 | 10 | 40 | 50 | Two hours | MSE OE-02 | 2 | ------- | 50 | 50 | Two hours |

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## M.Ed. (Gen)

| Existing | | | | | | Amended (approved by PG BoS) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Title | Credits | Internal Marks | External Marks | Total Marks | Duration of Exam | Course Title | Credits | Internal Marks | External Marks | Total Marks | Duration of Exam |
| OESS-I/ MOOCs | 00 | 00 | 50 | 50 | Two hours | OESS-I<br>MSE OE-01 | 00 | 00 | 50 | 50 | Two hours |
| OESS-II | 00 | 00 | 50 | 50 | Two hours | MSE OE-02 | 00 | 00 | 50 | 50 | Two hours |

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## M.A. (Education)

| Existing | | | | | | Amended (approved by PG BoS) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Title | Credits | Internal Marks | External Marks | Total Marks | Duration of Exam | Course Title | Credits | Internal Marks | External Marks | Total Marks | Duration of Exam |
| OESS-I | 2 | 10 | 40 | 50 | Two hours | OESS-I | 2 | ------- | 50 | 50 | Two hours |
| OESS-II | 2 | 10 | 40 | 50 | Two hours | OESS-II | 2 | ------- | 50 | 50 | Two hours |

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# KURUKSHETRA UNIVERSITY
# KURUKSHETRA

**(Established by the State Legislature Act XII of 1956)**
**('A$^{+}$' Grade NAAC Accredited)**

# SYLLABUS

of

# M.Ed. (Two Years) Programme

(Four Semesters)
(CBCS and based on LOCF)

# DEPARTMENT OF EDUCATION

**(w.e.f. Session: 2020-21)**

# DETAILED SCHEME OF EXAMINATION
## M.Ed. (Two Years) Programme

**(As per Curriculum Framework: M.Ed. (Two Years) Programme, as approved in the NCTE Recognition Norms and Procedures, 2014)**

The duration of the Programme leading to the Degree of Masters of Education (M.Ed.) will be two academic years i.e. four semesters.

| Course Code | Nomenclature of the Course | Credit | Total Marks | External Assessment | Internal Assessment |
|---|---|---|---|---|---|
| | **Semester – I** | | | | |
| MED101 | Psychology of Learning & Development | 4 | 100 | 70 | 30 |
| MED102 | History and Political Economy of Education | 4 | 100 | 70 | 30 |
| MED103 | Education Studies | 4 | 100 | 70 | 30 |
| MED104 | Introduction to Research Methods | 4 | 100 | 70 | 30 |
| MED105 | Communication Skills & Expository Writing | 1 | 25 | 25 (External-15 & Internal-10) (Joint evaluation by Internal & External Examiner) | |
| MED106 | Self Development | 1 | 25 | 25 (External-15 & Internal-10) (Joint evaluation by Internal & External Examiner) | |
| | **Semester – II** | | | | |
| MED107 | Philosophy of Education | 4 | 100 | 70 | 30 |
| MED108 | Sociology of Education | 4 | 100 | 70 | 30 |
| MED109 | Curriculum Studies | 4 | 100 | 70 | 30 |
| MED110 | Teacher Education: Pre-service & In-Service | 4 | 100 | 70 | 30 |



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| | | | | | |
|---|---|---|---|---|---|
| ED111 | Dissertation | 2 | 50 | 50 (External-35 & Internal-15)<br><br>(Joint evaluation by Internal & External Examiner) | |
| MED112 | Internship in a TEI | 4 | 100 | 100 (External-70 & Internal-30)<br><br>(Joint evaluation by Internal & External Examiner) | |
| OESS/ MOOCs Course - I | The students are required to opt any one OESS/ MOOCs Course (available during the ongoing session of M.Ed. Programme) being offered by any Department/ University.<br><br>The students are required to opt one OESS in Semester – II and one MOOCs Courses (available on SWAYAM Portal) in Semester – III (or as per the guidelines or directions issued by the regulatory bodies or university in this regard from time to time) | 0 | 50 | To be evaluated by the external agency i.e. the parent Department/ University offering the course, or as per the decision taken by the University in this context. | |
| | **Semester – III** | | | | |
| MED113(A) | Specialization Course-I (Stage Specific) Elementary Education | 4 | 100 | 70 | 30 |
| MED113(B) | Specialization Course-I (Stage Specific) Secondary & Senior Secondary Education | 4 | 100 | 70 | 30 |
| MED114(A) | Specialization Course-II (Stage Specific) Elementary Education | 4 | 100 | 70 | 30 |
| MED114(B) | Specialization Course-II (Stage Specific) Secondary & Senior Secondary Education | 4 | 100 | 70 | 30 |

Students are required to opt any one stage in Course above with code MED113 (Specialization Course-I) i.e. either select MED113(A) for stage 'Elementary Education' OR select MED113(B) for stage 'Secondary & Senior Secondary Education'.

Similarly, students are required to opt any one stage in Course above with code MED114 (Specialization Course-II) i.e. either select MED114(A) for stage 'Elementary Education' OR select MED114(B) for stage 'Secondary & Senior Secondary Education'.



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Further, the stages in above two Courses i.e. MED113 & MED114 should be selected by the students in accor with their degree of Qualifying Examination i.e. B.Ed. degree and as per the provisions and regulations issue the University/ Institution/ Department in this context.

Also the students are allowed to select only one stage i.e. either 'Elementary Education' OR 'Secondary & Senior Secondary Education' for both Courses i.e. MED113 (Specialization Course-I) and MED114 (Specialization Course-II)

| | | | | | |
|---|---|---|---|---|---|
| MED115 | Advanced Educational Research | 4 | 100 | 70 | 30 |
| MED116 | Teacher Education: Perspective, Research and Issues in Teacher Education | 4 | 100 | 70 | 30 |
| MED117 | Internship | 4 | 100 | 100 (External-70 & Internal-30)<br>(Joint evaluation by Internal & External Examiner) | |
| MED118 | Dissertation | 2 | 50 | 50 (External-35 & Internal-15)<br>(Joint evaluation by Internal & External Examiner) | |
| MED119 | Academic Writing. | 2 | 50 | 50 (External-35 & Internal-15)<br>(Joint evaluation by Internal & External Examiner) | |
| OESS/ MOOCs Course - II | The students are required to opt any one OESS/ MOOCs Course (available during the ongoing session of M.Ed. Programme) being offered by any Department/ University.<br>The students are required to opt one OESS in Semester – II and one MOOCs Courses (available on SWAYAM Portal) in Semester – III (or as per the guidelines or directions issued by the regulatory bodies or university in this regard from time to time) | 0 | 50 | To be evaluated by the external agency i.e. the parent Department/ University offering the course, or as per the decision taken by the University in this context. | |



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## Semester – IV

Specialization Courses I, II & III

(In Semester-IV, students are required to opt any three Specialization Courses i.e. I, II & III out of the given below options from A to G. Further, the students are required to opt the same stage specific options that they opted in Semester-III for Courses MED113 & MED114 i.e. if they have opted 'Elementary Education' for both Courses i.e. MED113 (Specialization Course-I) and MED114 (Specialization Course-II) then they should opt 'Elementary Education' stage specific options in all the three Specialization Courses (I, II & II) means option (i) of options given below. And, if they have opted 'Secondary & Senior Secondary Education' for both Courses i.e. MED113 (Specialization Course-I) and MED114 (Specialization Course-II) then they should opt 'Secondary & Senior Secondary Education' stage specific options in all the three Specialization Courses (I, II & II) means option (ii) of options given below.

| | | | | |
|---|---|---|---|---|
| MED120(A)(i) | Education: Policy, Economics and Planning (at Elementary Level) | 4 | 100 | 70 |
| MED120(A)(ii) | Education: Policy, Economics and Planning (at Secondary and Senior Secondary Level) | 4 | 100 | 70 |
| MED120(B)(i) | Management & Administration of Education (at Elementary Level) | 4 | 100 | 70 |
| MED120(B)(ii) | Management & Administration of Education (at Secondary and Senior Secondary Level) | 4 | 100 | 70 |
| MED120(C)(i) | Inclusive Education (at Elementary Level) | 4 | 100 | 70 |
| MED120(C)(ii) | Inclusive Education (at Secondary and Senior Secondary Level) | 4 | 100 | 70 |
| MED120(D)(i) | Education Technology (at Elementary Level) | 4 | 100 | 70 |
| MED120(D)(ii) | Education Technology (at Secondary and Senior Secondary Level) | 4 | 100 | 70 |
| MED120(E)(i) | Educational Measurement and Evaluation (at Elementary Level) | 4 | 100 | 70 |
| MED120(E)(ii) | Educational Measurement and Evaluation (at Secondary and Senior Secondary Level) | 4 | 100 | 70 |
| MED120(F)(i) | Comparative Education (at Elementary level) | 4 | 100 | 70 |
| MED120(F)(ii) | Comparative Education (at Secondary and Senior Secondary Level) | 4 | 100 | 70 |



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| | | | | |
|---|---|---|---|---|
| MED120(G)(i) | Educational and Vocational Guidance (at Elementary level) | 4 | 100 | 70 |
| MED120(G)(ii) | Educational and Vocational Guidance (at Secondary and Senior Secondary Level) | 4 | 100 | 70 |
| MED121 | Dissertation | 4 | 100 | 100 (External-70 & Internal-30)<br>(Joint evaluation by Internal & External Examiner) |

**DURATION: Each credit in a taught course is equated to one hour of teaching or two hours of seminars/ group work/ tutorial/ laboratory work/ field work/ workshop per week for 16 weeks. Thus, a 4-credit course entails 4 hours of regular teaching per week or as much as 8 hours of teaching and other programme activities.**



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# Kurukshetra University, Kurukshetra

## Master of Education in Special Education (Visual Impairment)

## M.Ed. SplEdu. (V.I.)

## Syllabus- CBCS

**Effective from Academic Session 2020-21**

**Two Years Duration**

**(04 Semesters)**

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305
MSE-306
MSE-OE-02
Note: gran

# INDEX


| Course | Course Title | Credits | Hours | Page No. |
|---|---|---|---|---|
| | **SEMESTER I** | | | **06-18** |
| MSE-101 | Developments in Education and Special Education | 4 | 60 | 6 |
| MSE-102 | Psychology of Development and Learning | 4 | 60 | 9 |
| MSE-103 | Identification, Assessment and Needs of Children with Visual Impairment | 4 | 60 | 12 |
| MSE-104 | Curriculum And Teaching Strategies for Children with Visual Impairment | 4 | 60 | 15 |
| MSE-105 | Practical related to Visual Impairment | 4 | --- | 18 |
| | **SEMESTER II** | | | **19-32** |
| MSE-201 | Research Methodology and Statistics | 4 | 60 | 19 |
| MSE-202 | Curriculum Design & Development | 4 | 60 | 22 |
| MSE-203 | Inclusive Education | 4 | 60 | 24 |
| MSE-204 | Application of advanced technology and persons with visual impairment | 4 | 60 | 27 |
| MSE-205 | Practical related to Visual Impairment | 4 | --- | 30 |
| MSE-OE-01 | Open Elective Course : Overview of diversity and special education/MOOC | 2 | 30 | 31 |
| **Note: There will be no addition of grades & marks in open Elective paper in grand total of the semester-II** | | | | |
| | **SEMESTER III** | | | **33-49** |
| MSE-301 | Perspectives in Teacher Education – In-service & Pre-service | 4 | 60 | 33 |
| MSE-302 | Educational Evaluation | 4 | 60 | 35 |
| MSE-303 | Adulthood and Family Issues | 4 | 60 | 38 |
| MSE-304 | **Elective Course(Any One)** | **4** | **60** | |
| MSE-304 A | Educational Management | | | 40 |
| MSE-304 B | Educational Technology | | | 42 |
| MSE-304 C | Guidance and Counseling | | | 44 |
| MSE- | Dissertation* | 2 | --- | 46 |




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| | | | | |
|---|---|---|---|---|
| 305 | | | | |
| MSE-306 | Field Engagement/ Internship as a Teacher Educator | 4 | --- | 47 |
| MSE-OE- 02 | Open Elective Course : Advance perspective in inclusive education/MOOC | 2 | 30 | 48 |
| **Note: There will be no addition of grades & marks in open Elective paper in grand total of the semester-III** | | | | |
| **SEMESTER IV** | | | | **50-57** |
| MSE-401 | Dissertation* | 14 | --- | 50 |
| MSE-402 | Field Engagement/ Internship as a Teacher Trainer | 4 | --- | 51 |
| **Total** | | 80 | | |

**SCHEME/INTRODUCTION to COURSE**

# Master of Education in Special Education (Visual Impairment)

## M.Ed. Spl.Edu. (V.I.)

## Syllabus- CBCS

**Semester I**

| Course code | Course title | Credits | Internal marks | External Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|
| MSE-101 | Developments in Education and Special Education | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-102 | Psychology of Development and Learning | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-103 | Identification, Assessment and Needs of Children with Visual Impairment | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-104 | Curriculum And Teaching Strategies for Children with Visual Impairment | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-105 | Practical related to Visual Impairment | 4 | 20 | 80 | 100 | |
| Total | | 20 | 100 | 400 | 500 | |

**Semester-II**

| Course code | Course title | Credits | Internal marks | External Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|
| MSE-201 | Research Methodology and Statistics | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-202 | Curriculum Design & Development | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-203 | Inclusive Education | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-204 | Application of advanced technology and persons with visual impairment | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-205 | Practical related to Visual Impairment | 4 | 20 | 80 | 100 | |
| MSE- | Open Elective Course : | 2 | 10 | 40 | 50 | 2 Hour |



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| | | | | | | |
|---|---|---|---|---|---|---|
| OE- 01 | Overview of diversity and special education/MOOC | | | | | |
| | Total | 20 | 100 | 400 | 500 | |

**Note: There will be no addition of grades & marks in open Elective paper in grand total of the semester-II**

**Semester-III**

| Course code | Course title | Credits | Internal marks | External Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|
| MSE-301 | Perspectives in Teacher Education – In-service & Pre-service | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-302 | Educational Evaluation | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-303 | Adulthood and Family Issues | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-304 | **Elective Course(Any One)** | 4 | 20 | 80 | 100 | 3 Hour |
| MSE-304 A | Educational Management | | | | | |
| MSE-304 B | Educational Technology | | | | | |
| MSE-304 C | Guidance and Counseling | | | | | |
| MSE-305 | Dissertation*(synopsis) | 2 | 50 | ---- | 50 | |
| MSE-306 | Field Engagement/ Internship as a Teacher Educator | 4 | 20 | 80 | 100 | |
| MSE-OE- 02 | Open Elective Course : Advance perspective in inclusive education/MOOC | 2 | 10 | 40 | 50 | 2 Hour |
| | Total | 22 | 150 | 400 | 550 | |

**Note: There will be no addition of grades & marks in open Elective paper in grand total of the semester-III**

** Teacher Educators need to select a problem for investigations and provide the necessary supportive and explanatory information as needed. Teacher Educators need to present the synopsis of their work.**Synopsis and presentation will be evaluated by Departmental Research committee (DRC).***

**Semester-IV**

| Course code | Course title | Credits | Internal marks | External Marks | Total Marks | Duration of Exam |
|---|---|---|---|---|---|---|
| MSE-401 | Dissertation* | 14 | 150 | 200 | 350 | |
| MSE-402 | Field Engagement/ Internship as a Teacher Trainer | 4 | 20 | 80 | 100 | |

| | | | | | |
|---|---|---|---|---|---|
| Total | 18 | 170 | 280 | 450 | |

*** Note: Suggestive/As per the University Regulations**

- Complete a review of related research literature in accordance with the research problems.
- Explain and describe the methodology used to conduct the research problem.
- Explain the significance of the results obtained after conducting the research study.
- Summarize the results, explain the corresponding conclusions derived and the subsequent recommendations formulated for further research and practice.
- Provide a list of references, other supportive documentation used for the study.
- Make an oral presentation on the completed work.

**Area E- Practical Related to Disability**

1. Elicit information from parents and professionals the relevant information about one child with Specific Disability.
2. Assess the child with Specific Disability, using formal and informal tools and identify the specific learning problems.
3. Write a comprehensive assessment report by analyzing and interpreting the data.
4. Develop an appropriate educational plan (current level, annual goals, short term objectives, methods and material and evaluation).
5. Collaborate with the class teachers and related professional to implement the IEP.
6. Implement IEP for a period of minimum 15 sessions (each session lasting for not less than 45 minutes).
7. Make class visits to support the student when the regular teacher teaches and collaborate with the class teachers.
8. Evaluate the child and write a report.

**Area F- Field Engagement/ Internship as Teacher Educators**

Each student trainee is expected to teach 10 lectures in Third & Fourth Semester to student trainees undergoing training in B.Ed.Spl.Ed. level in topics from the curriculum of B.Ed. Spl. Edu.



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# KURUKSHETRA UNIVERSITY
# KURUKSHETRA

(Established by the State Legislature Act-X-II of 1956)

# M.A. Education
# (2-Years)
## (Four Semesters)
# SYLLABUS
# CBCS

## DEPARTMENT OF EDUCATION
## 2020-21

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# KURUKSHETRA UNIVERSITY, KURUKSHETRA
## M.A. Education Syllabus - CBCS

### SEMESTER-I

| S. No. | Course code | Course title | Examination Marks | | Total Marks | Credits |
|---|---|---|---|---|---|---|
| | | | External | Internal | | |
| 1 | MAEd 101 | Philosophical Foundations of Education (Part one) | 80 | 20 | 100 | 4 |
| 2 | MAEd 102 | Sociological Foundations of Education (Part One) | 80 | 20 | 100 | 4 |
| 3 | MAEd 103 | Psychological Foundations of Education (Part One) | 80 | 20 | 100 | 4 |
| 4 | MAEd 104 | Research methods in Education (Part One) | 80 | 20 | 100 | 4 |
| 5 | MAEd 105 | Methods of data Analysis in Education (Part One) | 80 | 20 | 100 | 4 |

### SEMESTER-II

| S. No. | Course code | Course title | Examination Marks | | Total Marks | Credits |
|---|---|---|---|---|---|---|
| | | | External | Internal | | |
| 1 | MAEd 201 | Philosophical Foundations of Education (Part Two) | 80 | 20 | 100 | 4 |
| 2 | MAEd 202 | Sociological Foundations of Education (Part Two) | 80 | 20 | 100 | 4 |
| 3 | MAEd 203 | Psychological Foundations of Education (Part Two) | 80 | 20 | 100 | 4 |
| 4 | MAEd 204 | Research methods in Education (Part Two) | 80 | 20 | 100 | 4 |
| 5 | MAEd 205 | Methods of data Analysis in Education (Part Two) | 80 | 20 | 100 | 4 |
| 6 | OESS-I | Education for peace and human rights | 40 | 10 | 50 | 2 |

### SEMESTER-III

| S. No. | Course code | Course title | Examination Marks | | Total Marks | Credits |
|---|---|---|---|---|---|---|
| | | | External | Internal | | |
| 1 | MAEd 301 | Curriculum Development and Comparative Education(Part One) | 80 | 20 | 100 | 4 |
| 2 | MAEd 302 | Contemporary Issues in Indian Education (Part One) | 80 | 20 | 100 | 4 |
| 3 | MAEd 303 | Optional I: Any one of the following: | 80 | 20 | 100 | 4 |
| | | (A) Special Education (Part one) | 80 | 20 | 100 | 4 |
| | | (B) Educational Measurement and Evaluation (Part one) | | | | |
| | | (C) Teacher Education (Part One) | | | | |
| | | (D) Computer Education (Part One) | | | | |
| | | (E) Adult and Continuing Education | | | | |
| 4 | MAEd 304 | Optional II: Any one of the following: | 80 | 20 | 100 | 4 |
| | | (A) Management and administration of Education (Part One) | | | | |



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| | | | | | | |
|---|---|---|---|---|---|---|
| | | (B) Educational technology (Part One) | | | | |
| | | (C) Educational and Vocational Guidance | | | | |
| | | (D) Mental Hygiene and Education | | | | |
| | | (E) Economics of Education (Part One) | | | | |
| 5. | OESS-II | Education of learners with diverse needs | 40 | 10 | 50 | 2 |

**SEMESTER-IV**

| S. No. | Course code | Course title | Examination Marks | | Total Marks | Credits |
|---|---|---|---|---|---|---|
| | | | External | Internal | | |
| 1. | MAEd -401 | Dissertation | -- | -- | 100 | 4 |
| 2. | MAEd 402 | Curriculum Development and Comparative Education(Part Two) | 80 | 20 | 100 | 4 |
| 3. | MAEd- 403 | Contemporary Issues in Indian Education (Part Two) | 80 | 20 | 100 | 4 |
| 4. | MAEd- 404 | Optional I: Any one of the following: | 80 | 20 | 100 | 4 |
| | | (A) Special Education (Part Two) | 80 | 20 | 100 | 4 |
| | | (B) Educational Measurement and Evaluation (Part Two) | | | | |
| | | (C) Teacher Education (Part Two) | | | | |
| | | (D) Computer Education (Part Two) | | | | |
| | | (E) Adult and Continuing Education | | | | |
| 5. | MAEd 405 | Optional II: Any one of the following: | 80 | 20 | 100 | 4 |
| | | (A) Management and administration of Education (Part Two) | | | | |
| | | (B) Educational technology (Part Two) | | | | |
| | | (C) Educational and Vocational Guidance | | | | |
| | | (D) Mental Hygiene and Education | | | | |
| | | (E) Economics of Education (Part Two) | | | | |
| 6. | MAEd- 406 | Field Work | -- | -- | 50 | 2 |



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CP-2

REVISED SCHEME w.e.f. 2023-24

**B.Ed Spl. Edu. (V.I.)**

| Existing | | | | | | Amended (approved by UG BoS) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Title | Credits | Internal Marks | External Marks | Total Marks | Duration of Exam | Course Title | Credits | Internal Marks | External Marks | Total Marks | Duration of Exam |
| OESS-I BSE OE-01 | 2 | 10 | 40 | 50 | Two hours | OESS-I BSE OE-01 | 2 | ------- | 50 | 50 | Two hours |
| BSE OE-02 | 2 | 10 | 40 | 50 | Two hours | BSE OE-02 | 2 | ------- | 50 | 50 | Two hours |

Chairperson
Department of Education
Kurukshetra University
Kurukshetra

18.1.24 18.01.24 18/1/2024

18.1.24

18/1/24 18.1.24

03.04.24

# KURUKSHETRA UNIVERSITY, KURUKSHETRA
## B.Ed. Spl. Ed. (V.I.) SYLLABUS -CBCS

**Effective from Academic Session 2020-2021**
**Two Years Duration (4-Semesters)**

29.7.2020



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# KURUKSHETRA UNIVERSITY, KURUKSHETRA
## B.Ed. Spl. Ed. (V.I.) SYLLABUS -CBCS

### PART-I: INTRODUCTION TO PROGRAM

| Course | Course title | | Credits | Internal assessment | External assessment | Total marks | Duration of Exam (hours) |
|---|---|---|---|---|---|---|---|
| | **SEMESTER-I** | | | | | | |
| BSE-101 | Human Growth & Development | | 4 | 20 | 80 | 100 | 3 hours |
| BSE-102 | Contemporary India and Education | | 4 | 20 | 80 | 100 | 3 hours |
| BSE-103 | Introduction to Sensory Disabilities(VI, HI, Deaf-blind) | | 2 | 10 | 40 | 50 | 1.5 hours |
| BSE-104 | Introduction to Neuro Developmental (LD, ID/ MR, ASD), Locomotor and Multiple Disabilities (Deaf-Blind, CP, MD) | | 4 | 20 | 80 | 100 | 3 hours |
| BSE-105 | Identification of Children with visual impairment and assessment of needs | | 4 | 20 | 80 | 100 | 3 hours |
| BSE-106 | Practical: Cross Disability and Inclusion | | 2 | 10 | 40 | 50 | |
| | **SEMESTER-II** | | | | | | |
| BSE-201 | Learning, Teaching and Assessment | | 4 | 20 | 80 | 100 | 3 hours |
| BSE-202& 203 | Pedagogy of Teaching (V.I.) (any two courses from any two groups selecting one from one group) | | | | | | |
| | Group-A | I. Pedagogy of teaching Science to students with visual impairment | 4 | 20 | 80 | 100 | 3 hours |
| | Group-B | I. Pedagogy of teaching Mathematics to students with visual impairment<br>II. Pedagogy of teaching Social Science to students with visual impairment | 4 | 20 | 80 | 100 | 3 hours |
| | Group-C | I. Pedagogy of teaching Hindi to students with visual impairment<br>II. Pedagogy of teaching English to students with visual impairment | 4 | 20 | 80 | 100 | 3 hours |
| BSE-204 | Inclusive Education | | 2 | 10 | 40 | 50 | 1.5 hours |
| BSE- | Curriculum, Designing, Adaptation and | | 4 | 20 | 80 | 100 | 3 hours |



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| | | | | | | |
|---|---|---|---|---|---|---|
| 205 | Strategies for teaching expanded curriculum | | | | | |
| BSE-206 | Practical: Disability specialization (V.I.) | 2 | 10 | 40 | 50 | |
| BSE OE-I | $Open Elective: Introduction to Inclusive Education/ MOOC | 2 | 10 | 40 | 50 | 2 Hours |

$For students of other Departments.

$While, students of B. Ed. Spl. Edu. Program will earn two credits by selecting one open elective course of two credits out of the open elective courses offered by different departments on the university campus or MOOC as adopted by Department of Education. However, there will be no addition of credits and marks in Open Elective course in the Grand Total of semester-II.

**SEMESTER-III**

| | | | | | | |
|---|---|---|---|---|---|---|
| BSE-301 | Intervention and Teaching Strategies | 4 | 20 | 80 | 100 | 3 hours |
| BSE-302 | Technology and Education of Visually Impaired | 4 | 20 | 80 | 100 | 3 hours |
| BSE-303 | Psycho Social and Family Issues | 2 | 10 | 40 | 50 | 1.5 hours |
| BSE-304 | Practical: Disability Specialization (visual impairment) | 4 | 20 | 80 | 100 | |
| BSE-305 | Field Work: Main disability special school (visual impairment) | 4 | 20 | 80 | 100 | |
| BSE-306 | Reading and Reflecting on Texts (EPC) | 2 | 10 | 40 | 50 | 1.5 hours |
| BSE-307 | Performing and Visual Art (EPC) | 2 | 10 | 40 | 50 | 1.5 hours |
| BSE OE-II | $Open Elective: Inclusive Education: Policies and Legislative Provisions/ MOOC | 2 | 10 | 40 | 50 | 2 Hours |

$For students of other Departments.

$While, students of B. Ed. Spl. Edu. Program will earn two credits by selecting one open elective course of two credits out of the open elective courses offered by different departments on the university campus or MOOC as adopted by Department of Education. However, there will be no addition of credits and marks in Open Elective course in the Grand Total of the semester-III.

**SEMESTER-IV**

| | | | | | | |
|---|---|---|---|---|---|---|
| BSE-401 | Skill based Optional Course (Hearing Impairment) ANY ONE*<br>A. Guidance and Counselling(HI)<br>B. Early Childhood and Education (HI)<br>C. Applied Behavioural Analysis(HI)<br>D. Community based Rehabilitation(HI)<br>E. Applications of ICT in Classroom (HI)<br>F. Gender and Disability (HI)<br>G. Braille and Assistive Devices (VI) | 2 | 10 | 40 | 50 | 1.5 hours |
| BSE-402 | Skill based Optional Course (Hearing Impairment) ANY ONE* | 2 | 10 | 40 | 50 | 1.5 hours |



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29.7.20

| | | | | | | |
|---|---|---|---|---|---|---|
| | A. Orientation and Mobility (VI)<br>B. Communication Options: Oralism (HI)<br>C. Communication Options: Manual (Indian Sign Language) (HI) | | | | | |
| BSE-403 | Basic Research & Statistics (EPC) | 2 | 10 | 40 | 50 | 1.5 hours |
| BSE-404 | Practical: Cross Disability andInclusion | 4 | 20 | 80 | 100 | |
| BSE-405 | Field work: Other disability special school | 4 | 20 | 80 | 100 | |
| BSE-406 | Field Work: Inclusive school | 4 | 20 | 80 | 100 | |
| **GRAND TOTAL** | | **80** | **400** | **1600** | **2000** | |

*Student-teachers will be specialized in the hearing impairment-other than visual impairment- as per the Area B (Cross Disability and Inclusion) of curriculum framework given by RCI on pg-8. In case of student-teachers with disability; the choice of two optional courses C-20 & C-21 will be on case to case basis (e.g. students-teachers with VI and HI may opt for courses that are appropriate for them across C-20 &C-21).



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