KURUKSHETRA UNIVERSITY KURUKSHETRA
("A++" Grade Accredited by NAAC)

Syllabus for

Under-Graduate Programme

Bachelor of Science (B.Sc.) (Hons.) Information

Technology

(3rd & 4th Semester)

(Scheme-C)

Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020 w.e.f. 2024-25

Session: 2024-25	
Part A - Introduction	
Name of the Programme	**Bachelor of Science (B.Sc.) (Hons) (Information Technology)**
Subject	Information Technology
Semester	THIRD
Name of the Course	INDUSTRIAL ELECTRONICS
Course Code	B23-HIT-301
Course Type: (CC/MCC/MDC/CC-M/DSEC/ VOC/DSE/PC/AEC/VAC)	MCC-A4
Level of the course	200-299
Pre-requisite for the course (if any)	PHYSICS as a subject AT LEVEL-4.0 (CLASS XII)
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: **CLO-1** Identify various facilities required to set up a basic Instrumentation Laboratory. **CLO-2**. Acquire a critical knowledge of various Electrical Instruments used in the Laboratory. **CLO-3**. Demonstrate skills in using instruments like Rectifiers, Multimeters, Power supplies, Voltage Regulators etc. through hands-on experience. **CLO-4**. Understand the Principle and operation of different controlled rectifiers **CLO-5** To learn the use of various industrial devices and equipments

Credits	**Theory**	**Practical**	**Total**
	3	1	4
Contact Hours per week	3	2	5

Max. Marks: 100(70 Theory +30 Practical) Internal Assessment Marks: 20 Theory +10 Practical End Term Exam Marks: 50 Theory +20 Practical	Time: 3 Hours each for Theory & Practical

Part B- Contents of the Course		
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 compulsory and four more questions selecting one question from each unit.		
Unit	**Topics**	**Contact Hours**
I	**Overview of industrial electronics:** Importance in industrial automation and control, Safety considerations in industrial electronics **Basic Industrial Equipments:** Types of Electronic Instruments - Analog instruments & Digital Instruments, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), Function Generator (Block Diagram Approach only)	10
II	**Cathode Ray Oscilloscope**-Introduction, Block diagram of basic CRO, Cathode ray tube, Electron gun assembly, Screen for CRT, Time base operation, Vertical deflection system, Horizontal deflection system, Use of CRO for the measurement of voltage, frequency, phase difference, Digital Storage Oscilloscope(DSO-Basic Idea only) **Voltage Regulators**: Transistor Series voltage regulator - Transistor Shunt voltage regulator – Three terminal regulators (78XX and 79XX).	12
III	**Power Supplies**: Block Diagram of regulated power supply – A simple regulated transistorized power supply (circuit and working) – Principle and working of Switch Mode Power Supply (SMPS). **Thyristors:** Introduction of Thyristors Family, Silicon Controlled Rectifier, SCR Half wave rectifier circuit, SCR Full wave rectifier circuit, Two Transistor Analogy of SCRs TRAIC , DIAC (Construction, Working and Characteristics)	13
IV	DC-DC converters and inverters, Motor Drives and Control**:** Electric motors and types (AC and DC),Motor control methods and techniques, Variable Frequency Drives (VFDs) Industrial Communication: Serial communication protocols (RS-232, RS-485), Field bus systems (Profibus, Modbus), Ethernet-based industrial communication (Industrial Ethernet)	10

V*	Students have to perform six practicals out the list :	30
	1. Use of CRO to measure Voltage, Frequency and Phase Shift 2. Use of Multimeter and Function Generator 3. Study of Regulated Power Supply using 78xx and79xx 4. SCR V-I Characteristics 5. TRIAC Characteristics 6. DIAC Characteristics 7. Make a Project on DC Power Supply	

Suggested Evaluation Methods

Internal Assessment:	End Term Examination:
➢ **Theory(20 Marks)**	
● Class Participation **(5 Marks)**	**Theory: 50 Marks**
● Seminar/presentation/assignment/quiz/class test etc. **(5 Marks)**	
● Mid-Term Exam: **(10 Marks)**	
➢ **Practicum (10 Marks)**	**Practical: 20 Marks**
● Class Participation: **0**	
● Seminar/Demonstration/Viva-voce/Lab records etc**. (10 Marks)**	
● Mid-Term Exam: 0	

Part C-Learning Resources

Recommended Books/e-resources/LMS:
1. Industrial Electronics" by S. Brian Morris
2. Electronic Instrumentation by H.S.Kalsi , TMH Publishers
3. Industrial Electronics, S.B. Biswas, Dhanapur Rai & Sons.
4. Industrial Electronics, G.K. Mithal, Khanna Publishers.
5. "Power Electronics: Converters, Applications, and Design" by Ned Mohan, Tore M. Undeland, and William P. Robbins
6. "Electric Drives and Electromechanical Systems" by Sergey Edward Lyshevski
7. Electronic Devices and Circuits – G.K. Mithal.
8. "Industrial Communication Systems" by Wassim M. Haddad and Vijay S. Kumar

	Session: 2024-25		
	Part A - Introduction		
Name of the Programme	Bachelor of Science (B.Sc.) (Hons) (Information Technology)		
Subject	Information Technology		
Semester	THIRD		
Name of the Course	Computer Programming with C		
Course Code	B23-HIT-302		
Course Type: (CC/MCC/MDC/CC-M/DSEC/ VOC/DSE/PC/AEC/VAC)	MCC-A5		
Level of the course	200-299		
Pre-requisite for the course (if any)	-		
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: **CLO-1** Skills to Write, compile and debug programs in C language. **CLO- 2**. Use of different data types in a computer program. **CLO-3**. Design programs involving decision structures, loops, arrays and functions. **CLO-4**. Identify the difference between call by value and call by reference and Use pointers to understand the dynamics of memory **CLO-5**: To get the Handson practice of Programming in C		
Credits	**Theory**	**Practical**	**Total**
	3	1	4
Contact Hours per week	3	2	5

Max. Marks: 100(70 Theory +30 Practical) Internal Assessment Marks: 20 Theory +10 Practical End Term Exam Marks: 50 Theory +20 Practical	Time: 3 Hours each for Theory & Practical

| **Part B- Contents of the Course** ||

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 compulsory and four more questions selecting one question from each unit.

Unit	Topics	Contact Hours
I	Introduction to the C Language – Algorithm, Pseudo code, Flow chart, Background, C Programs, Identifiers, Data Types, Variables, Constants, Input / Output, Operators(Arithmetic, relational, logical, bitwise etc.), Expressions, Precedence and Associatively, Expression Evaluation, Type conversions.	10
II	Statements- Selection Statements(making decisions) – if and switch statements, Repetition statements (loops)-while, for, do-while statements, Loop examples, other statements related to looping – break, continue, go to, Simple C Program examples.	10
III	Functions- Introduction to Structured Programming, Functions- basics, user defined functions, inter function communication (call by value, call by reference), Standard functions. Storage classes-auto, register, static, extern, scope rules, arrays to functions, recursive functions, example C programs.	13
IV	Arrays– Basic concepts, one-dimensional arrays, two – dimensional arrays, multidimensional arrays, C programming examples Pointers – Introduction (Basic Concepts), pointers to pointers, compatibility, Pointer Applications, Arrays and Pointers, Pointer Arithmetic, memory allocation functions, array of pointers, pointers to void, pointers to functions, command –line arguments, Introduction to structures and unions	12

V*	**Attempt any six practicals:**	30

	1. (a) Write a program to take input of name, roll no and marks obtained by a student in 4 subjects of 100 marks each and display the name, roll no with percentage score secured.
	     (b) Write a program to print whether a given number is even or odd.
	2. (a) Write a program to print positive integers from 1 to 10.
	     (b) Write a program to insert 5 elements into an array and print the elements of the
	        array.
	3. Write a program to calculate factorial of a number using recursion.
	4. Write a program to find biggest among three numbers using pointer.
	5. Program to print Fibonacci series till n given number using function.
	
	6. Program to implement Calculator using functions.
	
	7. Program to print binary equivalent of given decimal number.
	
	8. Program to calculate the substring of a given input string.
	
	9. Program to implement a function that compares the two input strings and returns 0 if equal, otherwise tells which comes first.
	10. Program to calculate HCF of n numbers using function.	

Suggested Evaluation Methods

Internal Assessment:	End Term Examination:
➢ **Theory(20 Marks)**	
● Class Participation **(5 Marks)**	**Theory: 50 Marks**
● Seminar/presentation/assignment/quiz/class test etc. **(5 Marks)**	
● Mid-Term Exam: **(10 Marks)**	
➢ **Practicum (10 Marks)**	**Practical: 20 Marks**
● Class Participation: **0**	
● Seminar/Demonstration/Viva-voce/Lab records etc**.(10 Marks)**	
● Mid-Term Exam: 0	

Part C-Learning Resources

Recommended Books/e-resources/LMS:
1.   Let Us C Yashavant kanetkar BPB.
2.   Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
3.   Absolute beginner's guide to C, Greg M. Perry, Edition 2, Publisher: Sams Pub., 1994. 3. Computer Programming and Data Structures by E Balagurusamy, Tata McGraw Hill.

Part A- Introduction	
Name of the Programme	**Bachelor of Science (B.Sc.) (Hons) (Information Technology)**
Subject	Information Technology
Semester	THIRD
Name of the Course	Smart Electronics and Computer Networking
Course code	B23-HIT-303
Course Type: CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC	MDC-3
Level of the course	200-299
Pre-requisite for the course if any	Any Arts, Commerce Subject at 4.0 Level (Class XII)
Course Learning Outcomes(CLO):	After completing this course, the learner will be able to: **CLO1:** Understand the concept of CCTV **CLO2**: Understand the idea and concept of electronics in various fields **CLO3**:Understand various types of Softwares **CLO4**:Understand the concept of Hacking and Cracking **CLO5:** Learning the above through practicals

Credits	Theory	Practical	Total
	2	1	3
Contact Hours	2	2	4

Max. Marks: 75 (50 Theory + 25 Practical) Internal Assessment Marks: 15 Theory + 5 Practical End Term Exam Marks: 35 Theory + 20 Practical	Exam Time: 3 Hours each for Theory & Practical

Part B- Contents of the Course	

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.
3. Medium of examination may be Hindi/English.

Unit	Topics	Contact Hours
I	**Smart Electronics-I:** Evolution of smart homes; Video monitoring, Security and alarms, CCTV	**8**

II	**Smart Electronics-II**: Role of Electronics in Education and Agriculture (Drones for survey, Smart-irrigation);	**6**
III	**Networking concept:** Basic elements of a communication system, Transmission modes, Transmission medium, guided and unguided, Types of network: LAN, MAN and WAN, Difference between LAN and WAN	**8**
IV	**Computer Threats:** Introduction, Types of threats: Physical Threats and Non physical threats, Cookie, Hacking and cracking, Difference between Hackers and Crackers.	**8**
V*	**Note:** A candidate is required to perform minimum 3 activities out of the list provided during course of study in this semester. 1. Prepare a project report on proposed features of smart Homes 2. Prepare a PowerPoint presentation on any one electronic instrument used in Agriculture. 3. Creating and using e-mail 4. Using Internet for various Task	**30**

Suggested Evaluation Methods

Internal Assessment: ➢ **Theory 15 Marks** Class Participation: **4 Marks** Seminar/presentation/assignment/quiz/class test etc.: **4 Marks** Mid-Term Exam: **7 Marks** ➢ **Practicum 5 Marks** Class Participation: **0** Seminar/Demonstration/Viva-voce/Lab records etc.: **5 Marks** Mid-Term Exam: 0	**End Term Examination:** **35 Marks** **20 Marks**

Part C-Learning Resources

Recommended Books/e-resources/LMS:
1. **R**ibbens, "Understanding Automotive Electronics", 7th Edition, Elsevier, Indian Reprint, 2013.
2. Tom Denton, "Automotive Electric and Electronic Systems", 3rd Edition, Elsevier, 2004
3. https://kanchiuniv.ac.in/coursematerials/autotronics.pdf
4. Sensors and Actuators, D. Patranabis, 2nd Ed., PHI, 2013.
5. Sinha P.K. & Sinha, Priti, Computer Fundamentals, BPB.
6. Norton, Peter, Introduction to computer, Mcgraw-Hill
7. Rajaraman V., Fundamentals of Computers, PHI.

Session: 2024-25

Part A - Introduction

Name of the Programme	Bachelor of Science (B.Sc.) (Hons) (Information Technology)
Subject	Information Technology
Semester	FOURTH
Name of the Course	Transistor & Linear Integrated Circuits
Course Code	B23-HIT-401
Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/ DSE/PC/AEC/VAC)	MCC-A6
Level of the course	200-299
Pre-requisite for the course (if any)	-
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: **CLO-1** Understand the basic theory and working of Transistor **CLO-2**. Learn the concept of FET and MOSFET circuits. **CLO-3** understand the use and working of Operational Amplifiers **CLO-4**. Implement the applications of op-amp **CLO-5 .** Practice the use of transistors and op-amps through Handson .

Credits	Theory	Practical	Total
	3	1	4
Contact Hours per week	3	2	5

Max. Marks: 100(70 Theory +30 Practical) Internal Assessment Marks: 20 Theory +10 Practical End Term Exam Marks: 50 Theory +20 Practical	Time: 3 Hours each for Theory & Practical

Part B- Contents of the Course

Unit	Topics	Contact Hours
I	**Power Amplifiers**: Introduction, series –fed Class A amplifier, Transformer-Coupled Class A amplifier, Class B amplifier operation, Class B amplifier circuits, Amplifier distortion, Class C and Class D amplifier	10
II	**Operational Amplifier-I** : Differential amplifier-Dual input balanced output differential amplifier, block diagram of typical Op-Amp, schematic symbol, interpreting data sheet, the ideal Op-Amp, equivalent circuit of an Op-Amp, Op-Amp Parameters-Input Impedance, Output impedance, input offset voltage, Open Loop Voltage gain, input bias current, slew rate [definitions only] open loop Op-Amp configurations, Closed Loop Configuration	12
III	**Operational Amplifier-II:** Voltage series feedback amplifier, Voltage shunt feedback amplifier, summing, scaling and averaging amplifiers, integrator, differentiator, basic comparator, zero-crossing detector, Schmitt trigger.	12
IV	**Active Filters:** Butterworth First-order LPF , HPF , Band pass and Band Reject and second-order active filters Qualitative Approach (LPF & HPF), Filter frequency response and analysis **DC Voltage Regulators:** Voltage regulator basics, voltage follower regulator, adjustable output regulator, LM317 & LM337 Integrated circuits regulators.	11

V*	Students have to perform six practicals out the list :	30

	1. Study of Class –A Power Amplifier
	2. Study of Class –B Power Amplifier
	3. To study op-amp as-
	    a. (a)Unity gain buffer stage
	
	    b. (b) Non-inverting amplifier
	4. (c) Inverting amplifier
	5. To Study op-amp as-
	      i. Summing amplifier
	      ii. Difference amplifier
	6. To study the operation of integrating/differentiating circuits using op-amp.
	7. Measurement of offset voltage, bias currents & CMRR of an operational Amplifier.
	8. To study the working of Schmitt trigger using an operational amplifier.
	9. Design and Build an active Low Pass Filter
	10. Design and Build an active High Pass Filter	

Suggested Evaluation Methods

Internal Assessment:	End Term Examination:

➢ **Theory(20 Marks)**
 	
  ● Class Participation **(5 Marks)**
 	
  ● Seminar/presentation/assignment/quiz/class test etc. **(5 Marks)**
 	
  ● Mid-Term Exam: **(10 Marks)**
➢ **Practicum (10 Marks)**
 	
  ● Class Participation: **0**
 	
  ● Seminar/Demonstration/Viva-voce/Lab records etc**. (10 Marks)**
 	
  ● Mid-Term Exam: 0
	Theory: 50 Marks
	
	Practical: 20 Marks

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. 1 Basic Electronics & Linear Circuits, N N Bhargava, NITTR Chandigarh

2. Electronic Devices and Circuits – G.K. Mithal.

3. Electronic Devices and Circuits-Millman and Halkias- Tata Mc Graw Hill (TMH)

4. Op-Amps & Linear Integrated Circuits (Second Edition) [Chapters 1 to 4] Ramakant Gayakwad, Prentice Hall of India

5. Linear Integrated Circuits D Roy Choudhry & Shail B Jain New Age International Publishing

Session: 2024-25	
Part A - Introduction	
Name of the Programme	**Bachelor of Science (B.Sc.) (Hons) (Information Technology)**
Subject	Information Technology
Semester	FOURTH
Name of the Course	Fundamentals of Database Management Systems
Course Code	B23-HIT-402
Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/ DSE/PC/AEC/VAC)	MCC-A7
Level of the course	200-299
Pre-requisite for the course (if any)	-
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: **CLO-1** know the need and requirement of Data base **CLO-2**. Learn the various data base designs and database models **CLO-3** understand the concept of raltional algebra and calculus **CLO-4**. Understand the different constraints, views and SQL **CLO-5** get the Hands on practice of the database management systems

Credits	**Theory**	**Practical**	**Total**
	3	1	4
Contact Hours per week	3	2	5

Max. Marks: 100(70 Theory +30 Practical) Internal Assessment Marks: 20 Theory +10 Practical End Term Exam Marks: 50 Theory +20 Practical	Time: 3 Hours each for Theory & Practical

Part B- Contents of the Course

Unit	Topics	Contact Hours
I	**Introduction to Databases and Transactions**: What is database system, purpose of database system, view of data, relational databases, database architecture, transaction management,. **Data Models:** The importance of data models, Basic building blocks, Business rules, The evolution of data models, Degrees of data abstraction.	10
II	**Database Design, ER-Diagram and Unified Modeling Language**: Database design and ER Model: overview, ER-Model, Constraints, ER-Diagrams, ERD Issues, weak entity sets, Codd's rules, Relational Schemas, Introduction to UML **Relational database model:** Logical view of data, keys, integrity rules. Relational Database design: features of good relational database design, atomic domain and Normalization (1NF, 2NF, 3NF, BCNF).	12
III	**Relational Algebra and Calculus:** **Relational algebra**: introduction, Selection and projection, set operations, renaming, Joins, Division, syntax, semantics. Operators, grouping and ungrouping, relational comparison. **Calculus:** Tuple relational calculus, Domain relational Calculus, calculus vs algebra, computational capabilities.	13
IV	**Constraints, Views and SQL:** What is constraints, types of constrains, Integrity constraints, **Views:** Introduction to views, data independence, security, updates on views, comparison between tables and views **SQL:** data definition, aggregate function, Null Values, nested sub queries, Joined relations. Triggers.	10

V*	List of Practicals: Attempt any six practicals	30
	1. Design a Database and create required tables. For e.g. Bank, College Database 2. Apply the constraints like Primary Key , Foreign key, NOT NULL to the tables. 3. Write a sql statement for implementing ALTER,UPDATE and DELETE 4. Write the queries to implement the joins 5. Write the query for implementing the following functions: MAX(),MIN(),AVG(),COUNT() 6. Write the query to implement the concept of Intergrity constrains 7. Write the query to create the views 8. Perform the queries for triggers 9. Perform the following operation for demonstrating the insertion , updation and deletion using the referential integrity constraints 10. Write the query for creating the users and their role.	

Suggested Evaluation Methods

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", fifth Edition McGraw-Hill ,
2. Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning.

	Session: 2024-25
	Part A - Introduction
Name of the Programme	**Bachelor of Science (B.Sc.) (Hons) (Information Technology)**
Subject	Information Technology
Semester	FOURTH
Name of the Course	Electronic Communication
Course Code	B23-HIT-403
Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/ DSE/PC/AEC/VAC)	MCC-A8
Level of the course	200-299
Pre-requisite for the course (if any)	-
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: **CLO-1** understand the basic concept of communication **CLO-2**. Learn about amplitude modulation and demodulation techniques **CLO-3** . Learn about amplitude modulation and demodulation techniques **CLO-4**. Learn about Pulse Modulation methods **CLO-5** Handson the various practicals related to columniation

Credits	**Theory**	**Practical**	**Total**
	3	1	4
Contact Hours per week	3	2	5

Max. Marks: 100(70 Theory +30 Practical) Internal Assessment Marks: 20 Theory +10 Practical End Term Exam Marks: 50 Theory +20 Practical	Time: 3 Hours each for Theory & Practical

Part B- Contents of the Course		
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 compulsory and four more questions selecting one question from each unit.		
Unit	**Topics**	**Contact Hours**
I	**Communication Systems:** Elements of Communication Systems, Basic Terminology in communication system, Bandwidth of Signal, Bandwidth of Transmission medium, Propagation of Electromagnetic waves: Ground Wave, Sky wave, Space Wave	9
II	**Modulation & Demodulation** : Principle of modulation , Amplitude Modulation ,Percent Modulation ,upper & lower side frequencies ,upper & lower side bands, mathematical analysis of a modulated carrier wave, power relations in an AM wave, simple idea about different forms of amplitude modulation. A) DSB-SC B) SSB-TC C) SSBSC	12
III	**Frequency Modulation:** Frequency modulation , FM Sidebands, modulation index and number of side bands, mathematical expression for FM wave, Demodulation, diode detector for AM signals.FM detector , Limited and phase shift detectors, comparison between AM & FM.	12
IV	**Pulse Modulation:** PAM Modulation & Detection – PWM Modulation & Detection - PPM Modulation & Detection - Sampling Theorem – Quantization & Quantization Error – PCM Modulation & Detection - Companding – ASK – FSK – BPSK – QPSK – DPSK	12
V*	**List of Practicals: Attempt any six practicals** 1. Amplitude Modulation (AM) and Demodulation 2. Frequency Modulation and Demodulation 3. . Amplitude Shift Keying (ASK) modulation and Demodulation 4. Frequency Shift Keying (FSK) 5. PCM Modulation 6. PAM Modulation 7. Pulse Width Modulation 8. Binary Phase Shift Keying (BPSK)	30

Suggested Evaluation Methods	
Internal Assessment: ➢ **Theory(20 Marks)** ● Class Participation **(5 Marks)** ● Seminar/presentation/assignment/quiz/class test etc. **(5 Marks)** ● Mid-Term Exam: **(10 Marks)** ➢ **Practicum (10 Marks)** ● Class Participation: 0 ● Seminar/Demonstration/Viva-voce/Lab records etc**. (10 Marks)** ● Mid-Term Exam: 0	**End Term Examination:** **Theory: 50 Marks** **Practical: 20 Marks**
Part C-Learning Resources	

Recommended Books/e-resources/LMS:

1. Kennedy, George & Davis, Bernard "Electronic Communication Systems" Tata McGraw-Hill 4thEd.
2. Modem Analog & Digital Communication Systems: B.P. Lathi; Oxford Univ. Press.
3. Communication Systems S. Haykin, John Willy & Sons.
4. Taub, Herbert & Schilling, Donald L. "Communication Systems" Tata McGraw-Hill
5. Electronic Communication Systems: Fundamentals through Advanced (4thed.) Wayne Tomasi, Prentice Hall
6. Radio Engineering by G K Mithal
7. Electronic communications – Sanjeev Gupta – Khanna publications.

Part A - Introduction

Name of the Programme	**Bachelor of Science (B.Sc.) (Hons) (Information Technology)**
Subject	Information Technology
Semester	FOURTH
Name of the Course	**Object Oriented Programming with C++**
Course Code	B23-HIT-404
Course Type: **(CC/MCC/MDC/CC-M/DSEC/VOC/** **DSE/PC/AEC/VAC)**	DSE-A1
Level of the course	200-299
Pre-requisite for the course (if any)	-
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: **CLO-1** understand the fundamental principles of OO programming, **CLO-2**. Learn about key principles in OO analysis, design, and development. **CLO-3** . Learn about common patterns in OO design and implement them, **CLO-4**. familiar with alternative development processes **CLO-5** be exposed to technical writing and oral presentations using C++

Credits	**Theory**	**Practical**	**Total**
	3	1	4
Contact Hours per week	3	2	5

Max. Marks: 100(70 Theory +30 Practical) Internal Assessment Marks: 20 Theory +10 Practical End Term Exam Marks: 50 Theory +20 Practical	Time: 3 Hours each for Theory & Practical

Part B- Contents of the Course

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 compulsory and four more questions selecting one question from each unit.

Unit	Topics	Contact Hours
I	**Principles of Objective Oriented Programming**: Object Oriented Programming Paradigm, Basic Concepts of Object Oriented Programming, Benefits of Object Oriented Programming, Object Oriented Languages, Applications of Object Oriented Programming, Begining with C++ **Token Expressions & Control Structures**: Tokens, Keywords, Identifiers and Constants, Data Types, Type Compatibility, Variables, Operators in C++,Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures	10
II	**Functions in C++, Classes & Objects:** The Main Function, Function Prototyping, Call by Reference, Return by Reference, Inline Functions, Function Overloading, Friend and Virtual Functions. Specifying a class, Member Functions, Arrays within a clas	10
III	**Constructors & Destructors, Operator Overloading, Inheritance:** Constructors, Parameterized Constructors, Copy Constructors, Dynamic Constructors, Destructors, Defining Operator Overloading, Overloading Operators, Rules for Overloading Operators, Type Conversions	10
IV	**Pointers, Virtual Functions & Polymorphism, Working with Files, Exception handling**: Pointers, Pointers to Objects, this pointer, Pointer to Derived Classes, Virtual Functions, Classes for File Stream Operations, Opening and Closing a File, File Modes, File Pointers, Input Output Operations, Updating a File **An Object Oriented Approach in Real Life Problems:** Object Orientation O Development O Themes, Modeling, Abstraction Models.	15

V*	List of Practicals: Attempt any six practicals	30
	1. WAP to find the sum of two numbers using function. 2. WAP to find Simple Interest and Compound Interest. 3. WAP to demonstrate the working of following Loops: While, Do While, For, If-Else, switch 4. WAP to find greatest of three numbers. 5. WAP to check whether a number is even or odd. 6. WAP to check whether a year is leap year or not. 7. WAP to add and subtract two matrices. 8. WAP to display elements of an array. 9. WAP to calculate Sum and Average of an array. 10. Write a program to convert the temperature in Fahrenheit to Celsius and vice-a-versa 11. WAP to sort elements of an array using Bubble sort. 12. WAP to calculate Factorial of a number. 13. WAP to check whether a given number is Prime or not. 14. WAP to generate Fibonacci series. 15. WAP to show function Overloading. 16. WAP to create a class and access member function of a class	

Suggested Evaluation Methods

Internal Assessment:	End Term Examination:
➢ **Theory(20 Marks)**	
● Class Participation **(5 Marks)**	**Theory: 50 Marks**
● Seminar/presentation/assignment/quiz/class test etc. **(5 Marks)**	
● Mid-Term Exam: **(10 Marks)**	**Practical: 20 Marks**
➢ **Practicum (10 Marks)**	
● Class Participation: **0**	
● Seminar/Demonstration/Viva-voce/Lab records etc**. (10 Marks)**	
● Mid-Term Exam: 0	

Part C-Learning Resources

Recommended Books/e-resources/LMS:
1. Object Oriented Design by Rumbaugh (Pearson publication)
2. Object-oriented programming in Turbo C++ By Robert Lafore, Galgotia Publication.
3. Object-oriented programming with C++ by E.Balagurusamy, 2nd Edition, TMH.

Session: 2024-25	
Part A - Introduction	
Name of the Programme	**Bachelor of Science (B.Sc.) (Hons) (Information Technology)**
Subject	Information Technology
Semester	FOURTH
Name of the Course	**Programming in Java**
Course Code	B23-HIT-405
Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/ DSE/PC/AEC/VAC)	DSE-A1
Level of the course	200-299
Pre-requisite for the course (if any)	-
Course Learning Outcomes (CLO):	After completing this course, the learner will be able to: **CLO-1** understand the basic concepts of Java **CLO-2**. Learn class and object types in Java **CLO-3** understand the concept of file handling **CLO-4**. Learn the concepts of programming in Java **CLO-5** use the Concepts of Java using Programming

Credits	**Theory**	**Practical**	**Total**
	3	1	4
Contact Hours per week	3	2	5

Max. Marks: 100(70 Theory +30 Practical) Internal Assessment Marks: 20 Theory +10 Practical End Term Exam Marks: 50 Theory +20 Practical	Time: 3 Hours each for Theory & Practical

Part B- Contents of the Course

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 compulsory and four more questions selecting one question from each unit.

Unit	Topics	Contact Hours
I	**Introduction to Java**: Features of java , JDK Environment & tools like(java, javac, appletviewer, javadoc, jdb), OOPs Concepts Class, Abstraction , Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA , Structure of java program, Data types ,Variables ,Operators , Keywords ,Naming Convention, Decision Making (if, switch), Looping(for, while), Type Casting, Array Creating an array Types of Array - One Dimensional arrays - Two Dimensional array, String - Arrays , Methods. – String, Buffer class	10
II	**Classes and Objects:** Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance Simple, Multilevel, Interfaces, Abstract classes and methods, Implementation of Polymorphism. Method Overloading, Method Overriding, Nested and Inner classes, Modifiers and Access Control, Packages Concept Creating user defined packages, Java Built in packages java.lang->math java.util->Random, Date, Hashtable, Wrapper classes	11
III	**Collection:** Collection Framework.- Interfaces - Collection - List - Set - SortedSet - Enumeration - Iterator – ListIterator. Classes - Linked List - Array List - Vector - Hash Set - Tree Set – Hashtable. Working with maps -Map interface , Map classes - HashMap – Tree Map **File and Exception Handling:** Exception , Exception types , Using try catch and multiple catch Nested try, throw , throws and finally, Creating user defined Exceptions File Handling, Stream - ByteStream Classes CharacterStream Classes, File IO basics ,File operations Creating file ,Reading file(character, byte) ,Writing file (character, byte)	12
IV	**Applet, AWT and Swing Programming:** **Applet:** Introduction , Types applet , Applet Life cycle - Creating applet - Applet tag , Applet Classes - Color - Graphics - Font , **AWT** : Components and container used in AWT, Layout managers, Listeners and Adapter classes, Event Delegation model **Swing**: Introduction to Swing Component and Container Classes	12

*	**List of Practicals: Attempt any six practicals**	**30**
	Write a program to print the following triangle of numbers 1 1 2 1 2 3 1 2 3 4 1 2 3 4 5 1. Write a simple java application, to print the message , "Welcome to java" 2. Write a program to display the month of a year. Months of the year should be held in an array. 3. Write a program to assign two integer values to X and Y. Using the 'if' statement the output of the program should display a message whether X is greater than Y. 4. Write a program to find the area of rectangle. 5. Write a program to list the factorial of the numbers 1 to 10. To calculate the factorial value, use while loop. (Hint Fact of 4 = 4*3*2*1) 6. Create a JAVA program to implement the string operation. 7. Write a program with class variable that is available for all instances of a class. Use static variable declaration. 8. Observe the changes that occur in the objectÕs member variable value 9. Programming using AWT 10. Program on swings	

Suggested Evaluation Methods

Internal Assessment:	**End Term Examination:**
➢ **Theory(20 Marks)** ● Class Participation **(5 Marks)** ● Seminar/presentation/assignment/quiz/class test etc. **(5 Marks)** ● Mid-Term Exam: **(10 Marks)** ➢ **Practicum (10 Marks)** ● Class Participation: **0** ● Seminar/Demonstration/Viva-voce/Lab records etc**. (10 Marks)** ● Mid-Term Exam: 0	**Theory: 50 Marks** **Practical: 20 Marks**

Part C-Learning Resources

Recommended Books/e-resources/LMS:
1. Programming with JAVA - E Balgurusamy
2. The Complete Reference – JAVA Herbert Schild