

MPED 308 - Sports Psychology.**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 308.1	3	3	3	3	3	3	3	3	3
MPED 308.2	3	3	3	3	3	3	3	3	3
MPED 308.3	3	3	3	3	3	3	3	3	3
MPED 308.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 308.1	3	3	3	3	3
MPED 308.2	3	3	3	3	3
MPED 308.3	3	3	3	3	3
MPED 308.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 308.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 308.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 308.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 308.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

M.P.Ed – 309: Tests, Measurement and Evaluation in Physical Education.

Marks – 50

Credits=0.5

Course Outcomes: -

After completing the course contents of this course, the students will be able to: -

MPed 309.1 measure Body fat at different locations for man and women with skin fold caliper.

MPed 309.2 measure circumference & height of different body parts.

MPed 309.3 assess Physical fitness with Harvard Step test.

MPed 309.4 analyze posture with IOWA Posture test.

SYLLABUS

Marks - 50

- | | |
|---|------------|
| 1. Measuring of Body Fat with Skin fold Caliper | = 10 Marks |
| 2. Method of measuring Circumference: Arm, Waist, Hip and Thigh | = 10 Marks |
| 3. Calculating Physical Fitness Index with Harvard Step test | = 10 Marks |
| 4. Analysis of posture with IOWA posture test | = 10 Marks |
| 5. Method of Measuring the Standing Height and Sitting Height. | = 10 Marks |

MPED 309 - Tests, Measurement and Evaluation in Physical Education.**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 309.1	3	3	3	3	3	3	3	3	3
MPED 309.2	3	3	3	3	3	3	3	3	3
MPED 309.3	3	3	3	3	3	3	3	3	3
MPED 309.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 309.1	3	3	3	3	3
MPED 309.2	3	3	3	3	3
MPED 309.3	3	3	3	3	3
MPED 309.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 309.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 309.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 309.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 309.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

M.P.Ed. - 310: Wellness

Time: 2 Hours

Total Marks: 50 (Theory Marks: 40 + Internal Assessment: 10)

Credits=2

Note:- Paper setter will set nine questions in all out of which students will be required to attempt five questions.

1. Two long answer type questions will be set from each unit (1st, IInd,), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 16 marks each.
2. Question No. 1 will be compulsory and will carry 8 marks. It will comprise of 4 short answer type questions of 2 marks each selected from the entire syllabus.

Course Outcomes: -

After completing the course contents of this course, the students will be able to: -

MPed 310.1 understand meaning, dimensions and principles of Physical fitness and Wellness, their assessment, and calculation of Aerobic and Anaerobic training zones with their health benefits.

MPed 310.2 enhance and apply concept of balance diet, its components, factors, different types of nutrients, Electrolyte balance and Weight management through exercise and Diet planning.

SYLLABUS

Unit I – Introduction of Wellness

1. Meaning of Physical Fitness and Wellness
2. Dimensions of Wellness
3. Principles of physical fitness and wellness
4. Primary and Secondary components of fitness
5. Assessment of wellness
6. Difference between aerobic and anaerobic fitness
7. Calculation to aerobic and anaerobic training zone
8. Health benefits of aerobic and anaerobic exercise

Unit II –Nutritional aspect of Wellness

1. Meaning and concept of Balance Diet
2. Component of Balance diet.
3. Factor effecting balance diet.
4. Meaning and classification of Nutrients: Brief introduction of Micro and Macro Nutrients
5. Role of Fluid and electrolytes balance in healthy living
6. Symptoms and Results of Dehydration
7. Weight management through exercise and diet
8. Principles of Diet planning

Suggested Readings:

- David K. Miller & T. Earl Allen, Fitness, A life time commitment, Surjeet Publication Delhi 1989.*
- Dificore Judy, the complete guide to the postnatal fitness, A & C Black Publishers Ltd. 35 Bedford row, London 1998*
- Dr. A.K. Uppal, Physical Fitness, Friends Publications (India), 1992. Warner W.K. Oeger & Sharon A. Hoeger, Fitness and Wellness, Morton Publishing Company, 1990.*
- Elizabeth & Ken day, Sport fitness for women, B.T. Batsford Ltd, London, 1986.*
- Emily R. Foster, Karyn Hartiger & Katherine A. Smith, Fitness Fun, Human Kinetics Publishers 2002.*
- Lawrence, Debbie, Exercise to Music. A & C Black Publishers Ltd. 37, Sohe Square, London 1999*
- Robert Malt. 90 day fitness plan, D.K. publishing, Inc. 95, Madison Avenue, New York 2001*

MPed 310 - Wellness**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 310.1	3	3	3	3	3	3	3	3	3
MPED 310.2	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 310.1	3	3	3	3	3
MPED 310.2	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 310.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 310.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

M.P.Ed.-401: SPORTS JOURNALISM & MASS MEDIA

Time: 3 Hours

**Total Marks: 100 (Theory Marks: 80 + Internal Assessment: 20)
Credits=4**

Note:- Paper setter will set nine questions in all out of which students will be required to attempt five questions.

1. Two long answer type questions will be set from each of four units (1st, IIrd, IIIrd & IVth), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 15 marks each.
2. Question No. 9 will be compulsory and will carry 20 marks. It will comprise of 10 short answer type questions of 2 marks each selected from the entire syllabus.

Course Outcomes: -

After completing the course contents of this course, the students will be able to: -

- MPed 401.1** understand the meaning, elements and ethical standards of professionalism, Various sports news agencies, broadcasting channels and their role in sports.
- MPed 401.2** enhance knowledge about mass media and its different forms, role of media in sports and commercialization and privatization changes in sports media.
- MPed 401.3** understand about basic concepts of sport sociology, relationship of sports with culture, social interaction through sports and role of physical education in handling social problems.
- MPed 401.4** understand the about group cohesion, interaction, morale in group and about counseling and its skills in sports.

SYLLABUS

UNIT- I: Sport Journalism

1. Meaning, Definition and Elements of Journalism
2. Ethical Standards of Professional in Journalism
3. Sport as a Pondera of Jobs and Courses: - Sport Schemes and Incentives
4. Sport Journalists and Sport Writers Commentators, Broadcaster.
5. Sport News Agencies & Sport Broadcasting Channels.

UNIT- II: Mass Media and Functions of Mass Media in Sport

1. Mass Media in Journalism and Types of Mass Media (Print media, Electronic media and Folk media)
2. Sport coverage in different types of media
3. Advantage to a Sport person from Sport coverage
4. Role of media in making and breaking images in sport.
5. Impact of Commercialization and Privatization change in sport media.

UNIT- III: Sport Sociology

1. Meaning, Definition and Importance of Sport Sociology in Sport
2. Meaning, Definition, Structure and Relationship of Sport with Culture.
3. Meaning, Types and Processes of social interaction through Sport.
4. Relationship of Sport with Social Institution.
5. Role of Physical Education in context of social problems.

UNIT- IV: Group Cohesion in Sport

1. Nature and Group Dynamics in Sport
2. Group Cohesion in Sport
3. Group Interactions and Morale in Sport
4. Meaning and Types of Sport Society
5. Meaning of Counselling & its Need in Sport, fundamental of counseling Skills in Sport

REFERENCE:

- Ahiya B.N. (1988) Theory and Practice of Journalism: Set to Indian context Ed3. Delhi: Surjeet Publications
- Ahiya B.N. Chobra S.S.A. (1990) Concise Course in Reporting. New Delhi: Surjeet Publication
- Bhatt S.C. (1993) Broadcast Journalism Basic Principles. New Delhi. Haranand Publication
- Dhananjay Joshi (2010) Value Education in Global Perspective. New Delhi: Lotus Press.
- Kannan K (2000) Soft Skills, Madurai: Madurai: Yadava College Publication
- Mohit Chakrabarti (2008): Value Education: Changing Perspective, New Delhi: Kanishka Publication.
- Padmanabhan. A & Perumal A (2009), Science and Art of Living, Madurai: Pakavathi Publication
- Shiv Khera (2002), You Can Win, New Delhi: Macmillan India Limited.
- Varma A.K. (1993) Journalism in India from Earliest Times to the Present Period. Sterling publication Pvt. Ltd.
- Bhusan, V. and Sachdeva, An introduction to Sociology, Delhi: Kitab, 2003.
- Jain, Rachna, Sport Sociology, New Delhi: KSK, 2005
- Kanwaljeet, S., Sport Sociology, ND: Friends Pub. 2000.
- Yadvinder Singh, Sociology in Sport, Sport Publication, 7/26 Ansari road, Darya Ganj New Delhi- 110 002.
- Sharma, R.N. Urban Sociology, ND: Surjeet Pub., 1993.
- Singh, Bhupinder, Sport Sociology, New Delhi: Friends, 2004.
- IGNOU, The Study of Society – Understanding Sociology, Delhi- IGNOU, 2007.
- Turner, B., Cambridge Dictionary of Sociology, U.K., Cambridge, U.N. Press, 2006.
- Prof. A Yobu, Sociology of Sport, Friends Publications (India) 1014787/23, Ansri road, Darya Ganj, New Delhi- 110 002.
- Dr. Arun Kumar Singh – Advanced General Psychology, Moti Lal Banarasi Das Bungalow Road Jawahar Nagar Delhi.

MPED 401 - SPORTS JOURNALISM & MASS MEDIA**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 401.1	3	3	3	3	3	3	3	3	3
MPED 401.2	3	3	3	3	3	3	3	3	3
MPED 401.3	3	3	3	3	3	3	3	3	3
MPED 401.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 401.1	1	3	3	3	3
MPED 401.2	2	3	3	3	3
MPED 401.3	3	3	3	3	3
MPED 401.4	3	2	2	3	3
Average	2.25	2.75	2.75	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 401.1	3	3	3	3	3	3	3	3	3	1	3	3	3	3
MPED 401.2	3	3	3	3	3	3	3	3	3	2	3	3	3	3
MPED 401.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 401.4	3	3	3	3	3	3	3	3	3	3	2	2	3	3
Average	3	3	3	3	3	3	3	3	3	2.25	2.75	2.75	3	3

**M.P.Ed.-402: EDUCATION TECHNOLOGY IN PHYSICAL
EDUCATION.**

Time: 3 Hours

Maximum Marks: 100 (External: 80 + Internal: 20)

Credits:4

Note: - Paper setter will set nine questions in all out of which students will be required to attempt five questions.

1. Two long answer type questions will be set from each of four units (1st, IIrd, IIIrd & IVth), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 15 marks each.
2. Question No. 9 will be compulsory and will carry 20 marks. It will comprise of 10 short answer type questions of 2 marks each selected from the entire syllabus.

Course Outcomes: -

After completing the course contents of this course, the students will be able to: -

MPed 401.1 understand the meaning, characteristics, types and scope of education technology and to provide knowledge about communication and its related aspects.

MPed 402.2 Enhance the knowledge to differentiate between teaching and training their nature and characteristics, phases and principles of teaching in physical education and sports.

MPed 402.3 understand the meaning, need, types and structure of lesson plan

MPed 402.4 learn and apply multimedia approach in teaching-learning process.

SYLLABUS

Unit I – Introduction to Educational technology and Communication

1. Educational technology: meaning, characteristics and Scope. Types of educational technology: teaching technology, instructional technology, and behavior technology.
2. Communication: meaning, main features and need. Process of communication, barriers in effective communication and principles of communication.

Unit II – Concept of teaching in Physical Education

1. Meaning of Teaching, Difference between Teaching and training, difference between teaching and instructions, teaching as science, Nature and characteristics of teaching. Phases of teaching: Pre – active phase, Inter – active phase and Post active phase.
2. General principles of teaching in physical education.

Unit III – Lesson Planning

1. Meaning of lesson Plan, Need of lesson plan, essentials of a good lesson plan. Different Types of lesson plans, Pre- requisites of a lesson plan.
2. Structure of a lesson plan: Herbart's approach - Outline of lesson plan. Recent trends of Research in Educational Technology and its future with reference to physical education.

Unit IV – Audio Visual Media in Physical Education

1. Meaning of Audio-visual media Aids, Classification of Audio-visual media Aids. Characteristics of Audio-visual media Aids.
2. Procedure and organization of Teleconferencing/Interactive video-experiences in schools and colleges. Audio Conferencing and Interactive Radio Conference, its strengths and Limitations. Video/Educational Television: Telecast and Video recordings, its Strengths and limitation

REFERENCE:

Amita Bhardwaj, New Media of Educational Planning". Sarup of Sons, New Delhi-2003
Bhatia and Bhatia. The Principles and Methods of Teaching (New Delhi : Doaba House), 1959.
Education and Communication for development, O. P. Dahama, O. P. Bhatnagar, Oxford Page 68 of 71 IBH Publishing company, New Delhi
Essentials of Educational Technology, Madan Lal, Anmol Publications
K. Sampath, A. Pannirselvam and S. Santhanam. Introduction to Educational Technology (New Delhi: Sterling Publishers Pvt. Ltd.) : 1981.
Kochar, S.K. Methods and Techniques of Teaching (New Delhi, Jalandhar, Sterling Publishers Pvt. Ltd.), 1982
Kozman, Cassidy and Jackson. Methods in Physical Education (W.B. Saunders Company, Philadelphia and London), 1952.

MPED 402 - EDUCATION TECHNOLOGY IN PHYSICAL EDUCATION.**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 402.1	3	2	3	3	3	2	3	2	3
MPED 402.2	3	1	3	3	3	3	3	3	3
MPED 402.3	3	2	3	3	3	1	3	2	3
MPED 402.4	3	2	3	3	3	3	3	3	3
Average	3	1.75	3	3	3	2.25	3	2.5	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 402.1	3	3	3	3	3
MPED 402.2	3	2	3	3	3
MPED 402.3	2	3	3	3	3
MPED 402.4	3	3	3	3	3
Average	2.75	2.75	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 402.1	3	2	3	3	3	2	3	2	3	3	3	3	3	3
MPED 402.2	3	1	3	3	3	3	3	3	3	3	2	3	3	3
MPED 402.3	3	2	3	3	3	1	3	2	3	2	3	3	3	3
MPED 402.4	3	2	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	1.75	3	3	3	2.25	3	2.5	3	2.75	2.75	3	3	3

M.P.Ed.-403: SPORTS BIOMECHANICS

Time: 3 Hours

Maximum Marks: 100 (External: 80 + Internal: 20)

Credits:4

Note:- Paper setter will set nine questions in all out of which students will be required to attempt five questions.

1. Two long answer type questions will be set from each of four units (1st, IInd, IIIrd & IVth), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 15 marks each.
2. Question No. 9 will be compulsory and will carry 20 marks. It will comprise of 10 short answer type questions of 2 marks each selected from the entire syllabus.

Course Outcomes:-

After completing the course contents of this course, the students will be able to: -

- MPed 403.1** develop the concept of bio-mechanical terminologies such as distance, displacement, speed, velocity, acceleration, mass and weight along with motion and its variations.
- MPed 403.2** apply and demonstrate the concept of Lever and its types, force, its properties and its effects.
- MPed 403.3** apply and demonstrate the concept of centre of gravity, equilibrium, projectile and use of buoyancy force in different sports events.
- MPed 403.4** apply and demonstrate techniques of spin and mechanical analysis of walking, running, takeoff and landing in jump and short put.

SYLLABUS

Unit- I

1. Meaning and Scope of Biomechanics in Physical Education
2. Basic concepts of kinematics and kinetics
3. Definition of terms: Distance, Displacement, Speed, Velocity, Acceleration, Mass and Weight.
4. Meaning of Motion and types of Motion

Unit- II

1. Newton's Laws of Motion and their application in Sport.
2. **Lever:** (a) Classification of Levers and Lever Arms
 - a. (b) Concept of Mechanical advantage
 - b. (c) Human body levers.
3. **Force:** (a) Definition and Effects of Forces.
 - a. (b) Properties of Force
 - b. (c) Internal and External Forces
 - c. (d) Centripetal and Centrifugal Forces
 - d. (e) Friction: Meaning, Coefficient of friction, factors effecting friction

Unit – III

1. Meaning of Center of Gravity and Line of Center of Gravity
2. Meaning Equilibrium, types of equilibrium & principles of stability
3. Meaning of Projectile, Characteristics of Projectile, Range of Projectile, Height of Projectile
4. and Time of Projectile
5. Buoyancy Force and Principle of Flotation

Unit – IV

1. Meaning of Spin, Types of Spin, Effect of Spin on angle of rebound and velocity
2. Magnus Effect
3. Meaning of Work, Power and Energy
4. Mechanical Analysis of Gait Cycle Walking and Running
5. Mechanical Analysis of Long Jump (Takeoff and landing)
6. Mechanical Analysis Shot Put (Power Position and Delivery Phase)

REFERENCES

- Gowitzke, B.A and Milner, M (1988). *Scientific Basis of Human Movement. (3rd. ed.)* Baltimore: Williams and Wilkins.
- Groves, R and Camaine, D.(1983) . *Concepts in Kinesiology. (2nd.ed.)* Philadelphia: Saunders College Publishing.
- Hay, J & Reid, J (1982). *The Anatomical and Mechanical Bases of Human Motion.*Englewood Cliffs: Prentice – Hall
- Luttegens, Kathryn, Deutsch, Helga, Hamilton, Nancy. *Kinesiology – Scientific Basis of Human Motion. 8th.Ed, Brown & Bench mark.*
- Rasch, P. (1989). *Kinesiology and Applied Anatomy. Philadelphia: Lea & Febiger.*
- Thompson, C. (1985). *Manual of Structural Kinesiology. (10th. ed.)* St. Louis: Times Mirror/ Mosby College Publishing.
- Grabiner. M.D. *Current Issue is Biomechanics, New Delhi, 1993.*
- Mood, S.D., *Beyond Biomechanics, New York: Taylor, 1996.9.* Shaw, D. *Mechanical Bases of Biomechanics, Delhi: Sport Pub. 2000*
- Shaw, D. *Mechanical Bases of Biomechanics, London- A & C, 2003*

MPed 403 - SPORTS BIOMECHANICS.**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 403.1	3	3	3	3	3	2	3	3	3
MPED 403.2	3	3	3	3	3	1	3	3	3
MPED 403.3	3	3	3	3	3	1	3	3	3
MPED 403.4	3	3	3	3	3	2	3	3	3
Average	3	3	3	3	3	1.5	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 403.1	3	3	2	3	3
MPED 403.2	3	3	3	3	3
MPED 403.3	3	3	3	3	3
MPED 403.4	3	3	3	3	3
Average	3	3	2.75	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 403.1	3	3	3	3	3	2	3	3	3	3	3	2	3	3
MPED 403.2	3	3	3	3	3	1	3	3	3	3	3	3	3	3
MPED 403.3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
MPED 403.4	3	3	3	3	3	2	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	1.5	3	3	3	3	3	2.75	3	3

M.P.Ed.-404: SPORTS TECHNOLOGY.

Time: 3 Hours

Maximum Marks: 100 (External: 80 + Internal: 20)

Credits: 4

Note:- Paper setter will set nine questions in all out of which students will be required to attempt five questions.

1. Two long answer type questions will be set from each of four units (1st, IInd, IIIrd & IVth), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 15 marks each.
2. Question No. 9 will be compulsory and will carry 20 marks. It will comprise of 10 short answer type questions of 2 marks each selected from the entire syllabus.

Course Outcomes: -

After completing the course contents of this course, the students will be able to: -

- MPed 404.1** enhance the concept of sports technology, instrumentation, and various foams (Polyurethane, polystyrene, etc) and their uses in sports.
- MPed 404.2** apply nano-technology in sports material, equipments, play surfaces such as synthetic and cinder tracks, turf and cemented pitches, etc.
- MPed 404.3** apply concept of technology in surface of playfields and measuring gadgets in sports activities.
- MPed 404.4** apply and demonstrate modern sports facilities and training machines for enhancing training and competition performance.

SYLLABUS

Unit I – Sport Technology

1. Meaning and definition of Sport technology.
2. Significance of technology in Sport
3. General Principles of instrumentation in Sport.
4. Meaning of Foams, Types of foams (Polyurethane, Polystyrene, Styrofoam, closed-cell, open- cell foams and Neoprene) and there uses in different Sport.

Unit II – Nanotechnology in Sport Materials

1. Meaning and definition of Nanotechnology
2. Meaning of nano glue and nano moulding technology.
3. Uses and benefits of Nanotechnology in Sport uniforms, and safety equipments
4. Uses and benefits of Nanotechnology in Sport equipments and playing surfaces

Unit III – Surfaces of Playfields and Measuring Gadgets

1. Method of construction and installation for Synthetic and Cinder tracks.
2. Method of construction for Cricket pitches: Turf and Cemented.
3. Meaning and types of flooring materials for different Sport: synthetic (polyurethane and poly grass) and wooden.
4. Modern Measuring Equipments used in Running, Throwing and Jumping Events.

Unit IV – Modern Stadiums and Training Machines

1. Cricket: Bowling Machine, Mechanism and Advantages,
2. Tennis: Serving Machine, Mechanism and Advantages,
3. Dimensions of Sport Infrastructure - Gymnasium, Pavilion, Swimming Pool, Indoor Stadium and Out-door Stadium.
4. Lighting Facilities: Method of erecting and luminous in indoor and outdoor stadiums. Methods of measuring luminous.

REFERENCE:

Charles J.A. Crane, F.A.A. and Furness, J.A.G. (1987) “*Selection of Engineering Materials*” UK: Butterworth Heiremann.

Finn, R.A. and Trojan P.K. (1999) “*Engineering Materials and their Applications*” UK: Jaico Publisher.

John Mongilo, (2001), “*Nano Technology 101*” New York: Green wood publishing group. Walia, J.S. *Principles and Methods of Education* (Paul Publishers, Jullandhar), 1999.

Kochar, S.K. *Methods and Techniques of Teaching* (New Delhi, Jullandhar, Sterling Publishers Pvt. Ltd.), 1982

Kozman, Cassidy and Jackson. *Methods in Physical Education* (W.B. Saunders Company, Philadelphia and London), 1952.

MPed 404 - SPORTS TECHNOLOGY.**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 404.1	3	3	3	3	3	2	3	3	3
MPED 404.2	3	3	3	3	3	2	3	3	3
MPED 404.3	3	3	3	3	3	3	3	3	3
MPED 404.4	3	2	3	3	3	3	3	3	3
Average	3	2.75	3	3	3	2.5	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 404.1	3	2	2	3	2
MPED 404.2	3	3	2	3	2
MPED 404.3	3	3	2	3	3
MPED 404.4	3	3	2	3	3
Average	3	2.75	2	3	2.5

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 404.1	3	3	3	3	3	2	3	3	3	3	2	2	3	2
MPED 404.2	3	3	3	3	3	2	3	3	3	3	3	2	3	2
MPED 404.3	3	3	3	3	3	3	3	3	3	3	3	2	3	3
MPED 404.4	3	2	3	3	3	3	3	3	3	3	3	2	3	3
Average	3	2.75	3	3	3	2.5	3	3	3	3	2.75	2	3	2.5

M.P.Ed – 405: Option – (i) - Dissertation

Maximum Marks: 100

(Evaluation Marks =80+ Int. Assessment = 20)

Note: Students must submit their Dissertation in the office of the Department before the Start of 4th semester theory exams.

Course Outcomes: -

After completing the course contents of this course, the students will be able to: -

- MPed 405(i).1** enhance the basic concept of research and its need and characteristics in Physical Education and Sports.
- MPed 405(i).2** enhance the knowledge about research process and its contents.
- MPed 405(i).3** apply review of related literature.
- MPed 405(i).4** apply statistical techniques for computing results and writing research reports.

MPED 405 - Option – (i) – Dissertation.**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 405(i).1	3	2	3	3	3	3	1	1	3
MPED 405(i).2	3	2	3	3	3	3	2	3	3
MPED 405(i).3	3	3	3	3	3	3	1	3	3
MPED 405(i).4	3	3	3	3	3	3	3	3	3
Average	3	2.5	3	3	3	3	1.75	2.50	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 405(i).1	3	2	3	3	3
MPED 405(i).2	3	2	3	3	3
MPED 405(i).3	3	2	3	3	3
MPED 405(i).4	3	2	3	3	3
Average	3	2	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 405(i).1	3	2	3	3	3	3	1	1	3	3	2	3	3	3
MPED 405(i).2	3	2	3	3	3	3	2	3	3	3	2	3	3	3
MPED 405(i).3	3	3	3	3	3	3	1	3	3	3	2	3	3	3
MPED 405(i).4	3	3	3	3	3	3	3	3	3	3	2	3	3	3
Average	3	2.5	3	3	3	3	1.75	2.50	3	3	2	3	3	3

M.P.Ed – 405 Option – (ii): Sport Management.

Time: Three Hours

Maximum Marks: 100 (Theory Marks: 80 + Internal Assessment: 20)

Note: Paper setter is required to set 2 questions from each Unit - I, II, III and IV. Unit - V consists of 10 questions of short answers distributed from all over the syllabus. The candidates are required to attempt one question from each Unit – I, II, III & IV carrying 15 marks for each question. Unit - V is compulsory for all consisting 2 marks of each short answer.

Course Outcomes: -

After completing the course contents of this course, the students will be able to: -

- MPED 405(ii).1** enhance the concept, need, career opportunities, functional elements and different processes of sports management.
- MPED 405(ii).2** apply and demonstrate different approaches of Leadership, purpose, importance, principles and major problems in communication techniques in sports.
- MPED 405(ii).3** understand the meaning, importance, principles, steps of planning and guidelines for sound public relation.
- MPED 405(ii).4** apply knowledge of Human resource management in staff recruitment, their selection, responsibility and their relationship with the staff.

SYLLABUS

UNIT- I: Introduction to Sport Management

- i Meaning, Definition and need of Sport Management.
- ii Scope of Sport Management.
- iii Career Opportunities in Sport Management.
- iv Functional Elements of Sport Management.
- v Different Processes of Sport Management.

UNIT- II: Leadership & Communication in Sport Management.

- i Meaning of Leadership, Leader Skills and Features of Sport Leader.
- ii Various Approaches of Leadership in Sport Management.
- iii Meaning, Purpose & Importance of Communication.
- iv Principles of Effective Communications.
- v Major Problems in Communication and Information System.

UNIT- III: Planning and Public Relation in Sport Management.

- i Meaning, Definitions and Importance of Planning.
- ii Steps and Principles of Planning.
- iii Developing Planning Premises & Categories of Plans.
- iv Meaning and Importance of Public Relation in Sport Management.
- v Guidelines for Sound Public Relation and Essential of Public Relation Programme.

UNIT- IV: Human Recourse in Sport Management.

- i Staff Recruitment and Selection.
- ii Guidelines for Staff Recruitment and Selection.
- iii General Qualifications of Staff in Sport Management.
- iv Responsibilities of Staff Members
- v Supervisory Working Relationship with Staff.

REFERENCE:

- Bonnie, L. (1991) The Management of Sport. St. Louis: Mosby Publishing Company*
Bucher A. Charles, (1993) Management of Physical Education And Sport. St. Louis: Mosby Publishing Company
Chelladurai, P.(1999), Human Resources Management in Sport and Recreation. Human Kinetic.
Lisa Pike Masteralexis, Carol A. Barr.(2005) Principles and Practice of Sport Management (Second Edition) Jones and Barlett Publishers.
Harold Koontze, Cyril O' Donnel Management – A system and contingency Analysis of Managerial Function VI Edition.
Koontze & O Donnel – Essentials of Management. Mc graw Hill, Kogakusha Ltd.

MPED 405 - Option – (ii): Sport Management.**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 405(ii).1	3	3	3	3	3	3	3	3	3
MPED 405(ii).2	3	3	3	3	3	3	3	3	3
MPED 405(ii).3	3	3	3	3	3	3	3	3	3
MPED 405(ii).4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 405(ii).1	2	3	2	3	3
MPED 405(ii).2	2	3	3	3	2
MPED 405(ii).3	3	2	3	3	2
MPED 405(ii).4	1	2	2	3	3
Average	2	2.5	2.5	3	2.5

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 405(ii).1	3	3	3	3	3	3	3	3	3	2	3	2	3	3
MPED 405(ii).2	3	3	3	3	3	3	3	3	3	2	3	3	3	2
MPED 405(ii).3	3	3	3	3	3	3	3	3	3	3	2	3	3	2
MPED 405(ii).4	3	3	3	3	3	3	3	3	3	1	2	2	3	3
Average	3	3	3	3	3	3	3	3	3	2	2.5	2.5	3	2.5

MPed – 406: Game – I (Baseball, Softball & Lawn tennis)

Marks – 100

Credits=2.5

Course Outcomes: -

After completing the course contents of this course, the students will be able to: -

MPED 406.1 mark Baseball ground, Softball ground & Lawn tennis court.

MPED 406.2 demonstrate basic techniques of Baseball ground, Softball ground.

MPED 406.3 demonstrate basic techniques of Lawn tennis court.

MPED 406.4 fill score sheets and use signals.

SYLLABUS

i) Baseball & Softball

Marks – 50

(Marks – 10)

1. Marking of baseball& Softball court

(Marks – 10)

2. Teaching ability of various basic skills of baseball& Softball

(Marks – 10)

3. Interpretation of Various rules of baseball& Softball

(Marks – 10)

4. Filling the score sheet of baseball& Softball

(Marks – 10)

5. Officiating Symbols

ii) Lawn Tennis/Table tennis

Marks – 50

(Marks – 10)

1. Marking of Lawn Tennis Court/T.T. table

(Marks – 10)

2. Teaching ability of various basic skills of Lawn Tennis/T.T

(Marks – 10)

3. Interpretation of Various rules of Lawn Tennis/T.T

(Marks – 10)

4. Filling the score sheet of Lawn Tennis/T.T

(Marks – 10)

5. Officiating Symbols of Lawn Tennis/T.T

Note: Candidate have to take total 5 teaching lessons of different skills of both games.

MPED 406 – Game – I (Baseball, Softball & Lawn tennis).**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 406.1	3	3	3	3	3	3	3	3	3
MPED 406.2	3	3	3	3	3	3	3	3	3
MPED 406.3	3	3	3	3	3	3	3	3	3
MPED 406.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 406.1	3	3	3	3	3
MPED 406.2	3	3	3	3	3
MPED 406.3	3	3	2	3	3
MPED 406.4	3	2	2	3	3
Average	3	2.75	2.5	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 406.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 406.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 406.3	3	3	3	3	3	3	3	3	3	3	3	2	3	3
MPED 406.4	3	3	3	3	3	3	3	3	3	3	2	2	3	3
Average	3	3	3	3	3	3	3	3	3	3	2.75	2.5	3	3

MPed – 407: Game – II (Football & Badminton)

Marks – 100

Credits=2.5

Course Outcomes: -

After completing the course contents of this course, the students will be able to: -

MPED 407.1 mark Football ground & Badminton court.

MPED 407.2 demonstrate basic techniques of Football ground.

MPED 407.3 demonstrate basic techniques of Badminton court.

MPED 407.4 fill score sheets and use signals.

SYLLABUS

i) Football

Marks – 50

- | | |
|---|--------------|
| 1. Marking of Football Court | (Marks – 10) |
| 2. Teaching ability of various basic skills of Football | (Marks – 10) |
| 3. Interpretation of Various rules of Football | (Marks – 10) |
| 4. Filling the score sheet of Football | (Marks – 10) |
| 5. Officiating Symbols | (Marks – 10) |

ii) Badminton

Marks – 50

- | | |
|--|--------------|
| 1. Marking of Badminton Court | (Marks – 10) |
| 2. Teaching ability of various basic skills of Badminton | (Marks – 10) |
| 3. Interpretation of Various rules of Badminton | (Marks – 10) |
| 4. Filling the score sheet of Badminton | (Marks – 10) |
| 5. Officiating Symbols of Badminton | (Marks – 10) |

Note: Candidate have to take total 5 teaching lessons of different skills of both games.

MPED 407 - Game – II (Football & Badminton).**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 407.1	3	3	3	3	3	3	3	3	3
MPED 407.2	3	3	3	3	3	3	3	3	3
MPED 407.3	3	3	3	3	3	3	3	3	3
MPED 407.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 407.1	3	3	3	3	3
MPED 407.2	3	3	3	3	3
MPED 407.3	3	3	2	3	3
MPED 407.4	3	2	2	3	3
Average	3	2.75	2.5	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 407.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 407.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MPED 407.3	3	3	3	3	3	3	3	3	3	3	3	2	3	3
MPED 407.4	3	3	3	3	3	3	3	3	3	3	2	2	3	3
Average	3	3	3	3	3	3	3	3	3	3	2.75	2.5	3	3

M.P.Ed – 408: Classroom Teaching

Marks – 100

Credits=1

Course Outcomes: -

After completing the course contents of this course, the students will be able to: -

MPED 408.1 enhance and apply knowledge of lesson planning.

MPED 408.2 demonstrate subject matter through effective presentation techniques.

MPED 408.3 apply and use appropriate pedagogical techniques in presenting subject matter.

MPED 408.4 construct different types of lesson planning for various sports activities.

SYLLABUS

Note: Candidate have to take total 5 classroom teaching lessons on different topics related to physical education.

- (i) Candidate has to preparation five lessons delivered in the class during teaching practice in the notebook.
- (ii) Assessment will be made by the external and internal examiners on the basis on performance, confidence level, body language in teaching and use of audio visual aids related to subject matter.

MPed 408 - Classroom Teaching**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPED 408.1	3	2	3	1	3	3	3	2	3
MPED 408.2	3	2	3	1	3	3	3	2	3
MPED 408.3	3	2	3	1	3	2	3	2	3
MPED 408.4	3	2	3	1	3	3	3	2	3
Average	3	2	3	1	3	2.75	3	2	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 408.1	2	2	2	3	3
MPED 408.2	2	3	3	3	3
MPED 408.3	3	3	3	3	3
MPED 408.4	1	3	2	3	3
Average	2	2.75	2.5	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPED 408.1	3	2	3	1	3	3	3	2	3	2	2	2	3	3
MPED 408.2	3	2	3	1	3	3	3	2	3	2	3	3	3	3
MPED 408.3	3	2	3	1	3	2	3	2	3	3	3	3	3	3
MPED 408.4	3	2	3	1	3	3	3	2	3	1	3	2	3	3
Average	3	2	3	1	3	2.75	3	2	3	2	2.75	2.5	3	3

CO-PO-PSO Mapping Matrix for all the courses of M.P.Ed.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.P.Ed 101	2.75	2.25	3	3	2.25	2.5	2.5	2.5	2.75	3	2.5	2	3	2
M.P.Ed 102	3	3	3	2	3	3	2.75	2.75	3	2.5	2.75	2.5	2.75	1.5
M.P.Ed 103	3	2.5	3	3	3	2	2	1.5	3	1.25	3	3	3	3
M.P.Ed 104	3	2.75	3	3	2.75	2.75	2.25	2.75	3	3	3	3	3	1.5
M.P.Ed 105	3	1.5	3	3	3	1.75	2.5	2.5	3	3	1.75	2	3	3
M.P.Ed 106	3	3	3	1	3	3	3	3	3	3	3	3	3	3
M.P.Ed 107	3	3	3	2	3	3	3	3	3	2.5	2.5	3	3	3
M.P.Ed 108	3	3	3	3	3	3	3	2.5	3	2.75	2.75	2.25	3	1
M.P.Ed 109	3	3	3	3	3	2.5	3	3	3	3	3	3	3	3
M.P.Ed 201	2.75	2.25	3	3	2.25	2.5	2.5	2.5	2.75	3	2.5	2	3	2
M.P.Ed 202	3	3	3	3	3	2	2.5	1.5	3	2.25	3	2.75	3	2.5
M.P.Ed 203	3	2.75	3	3	3	2	3	2	3	3	2.5	2.5	3	3
M.P.Ed 204	3	2.75	3	3	2.75	3	3	3	3	3	3	3	3	3
M.P.Ed 205	3	3	3	3	3	3	3	2.75	3	3	3	3	3	3
M.P.Ed 206	3	3	3	3	3	3	3	3	3	2.50	3	2	3	3
M.P.Ed 207	3	3	3	3	3	3	3	3	3	3	2.75	2.5	3	3
M.P.Ed 208	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.P.Ed 209	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.P.Ed 210	3	3	3	3	3	3	2.5	3	3	3	3	3	3	3
M.P.Ed 301	3	3	3	3	3	2.5	3	2.25	3	2.75	2.5	2.75	3	3
M.P.Ed 302	3	3	3	3	3	2.75	3	3	3	3	3	3	3	3
M.P.Ed 303	3	3	3	3	3	3	3	3	3	3	2.25	2.25	3	3
M.P.Ed 304	3	3	3	3	2.5	3	3	3	3	2.75	3	3	3	3
M.P.Ed 305	3	3	2	2.75	2.5	3	3	3	3	2.5	1.50	2	3	3
M.P.Ed 306	3	3	3	3	3	3	3	3	3	3	2.75	2.5	3	3
M.P.Ed 307	3	3	3	3	3	3	3	3	3	3	2.75	2.5	3	3
M.P.Ed 308	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.P.Ed 309	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.P.Ed 310	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.P.Ed 401	3	3	3	3	3	3	3	3	3	2.25	2.75	2.75	3	3
M.P.Ed 402	3	1.75	3	3	3	2.25	3	2.5	3	2.75	2.75	3	3	3
M.P.Ed 403	3	3	3	3	3	1.5	3	3	3	3	3	2.75	3	3
M.P.Ed 404	3	2.75	3	3	3	2.5	3	3	3	3	2.75	2	3	2.5
M.P.Ed 405(i)	3	2.5	3	3	3	3	1.75	2.50	3	3	2	3	3	3
M.P.Ed 405(ii)	3	3	3	3	3	3	3	3	3	2	2.5	2.5	3	2.5
M.P.Ed 406	3	3	3	3	3	3	3	3	3	3	2.75	2.5	3	3
M.P.Ed 407	3	3	3	3	3	3	3	3	3	3	2.75	2.5	3	3
M.P.Ed 408	3	2	3	1	3	2.75	3	2	3	2	2.75	2.5	3	3

Attainment of COs:

The attainment of Cos can be measured on the basis of the results of internal assessment and semester examination. The attainment is measured on scale of 3 after setting the target for COs attainment. Table 5 shows the CO attainment levels assuming the set target of 60% marks:

Table 5 : CO Attainment Levels for internal assessment.

Attainment Level	
1 (Low level of attainment)	50% of students score more than 50% of marks in class tests of a course.
2 (Medium level of attainment)	60% of students score more than 50% of marks in class tests of a course.
3 (High Level of attainment)	70% of students score more than 50% of marks in class tests of a course.

Note: In the above table, the set target is assumed as 50%. It may vary in different departments/institutes. The staff Councils of the departments/institutes may finalize the set target

A proper mapping of course outcomes with assessment methods should be defined before measuring the attainment level. The questions in tests for internal assessment are based on COs. Here it is assumed that class test – I is based on first two COs (i.e. MPED 101.1 and MPED 101.2) of a course with equal weightage given to both COs. Similarly class test – II is based on next two COs (i.e. MPED 101.3 and MPED 101.4) of a course with equal weightage given to these two COs. For each internal assessment test, the percentage of students attaining the target level of CO is estimated and average percentage will decide the attainment level of COs. Following steps may be followed for determining the attainment level in internal assessment of course.

- Estimate the %age of students scoring set target (say 50%) or more in the questions of test-I based on first CO i.e. MPED101.1
- Estimate the %age of students scoring set target (50%) or more in the question(s) of test-I based on second CO i.e. MPED101.2
- Estimate the %age of students scoring set target (50%) or more in the question(s) of test-II based on third CO i.e. MPED101.3
- Estimate the %age of students scoring set target (50%) or more in the question(s) of test-II based on fourth CO i.e. MPED101.4
- Take average of the percentages obtained above.
- Determine the attainment level i.e. 3, 2 or 1 as per scale defined in table 5.

Note: In the above steps, it is assumed that internal assessment is based on two tests only. However if internal assessment is based on more than two tests and/or on assignment then same may be incorporated to determine the CO attainment level. There may be more than four COs for a course. The set target may also be different for different Cos. These issues may resolved by the Staff Councils of the departments/institutes.

CBCS/LOCF/M.P.Ed. – Two Year Program/KUK

For determining the attainment levels for end semester examination, it is assumed that questions in the end term examination are based on all COs of the course. Attainment levels for end semester examination of a course can be determined after the declaration of the results. The CO attainment levels for end semester examination are given in Table 6.

Table 6 : CO Attainment Levels for End Semester Examination (ESE)

Attainment Level	
1 (Low level of attainment)	60% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
2 (Medium level of attainment)	70% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
3 (High Level of attainment)	80% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.

Note: In the above table, the set target is assumed as grade A for CBCS courses and 60% for non-CBCS courses. It may vary in different departments/institutes. The staff Councils of the departments/institutes may finalize the set target.

Overall CO Attainment level of a Course:

The overall CO attainment level of a course can be obtained as:

Overall CO attainment level = 50% of CO attainment level in Internal assessment + 50% of Co Attainment level in end semester examination.

The overall COs attainment level can be obtained for all the courses of the program in a similar manner.

Attainment of POs:

The overall attainment level of POs is based on the values obtained using direct and indirect methods in the ratio of 80:20. The direct attainment of Pos is obtained through the attainment of COs. The overall CO attainment value as estimated above and CO-PO mapping value as shown in Table 4 are used to compute the attainment of POs. PO attainment values obtained using direct method can be written as shown in the Table 7.

Table 7: PO Attainment Values using Direct Method

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
MPed 101									
MPed 102									
MPed 103									
-									
MPed 408									
Direct PO attainment	Average of above values	Average of above values	Average of above values	--	--	--	--	--	Average of above values

The PO attainment values to be filled in above table can be obtained as follows:

For MPed101-PO1 Cell:

PO1 attainment value = (Mapping factor of MPed101-PO1 from Table 4 x Overall CO attainment value for the course MPed101)/3

For MPed104-PO1 Cell:

PO1 attainment value = (Mapping factor of MPed104-PO1 from Table 4 x Overall CO attainment value for the course MPed104)/3

Similarly values for each cell of Table 7 can be obtained. The direct attainment of POs is average of individual PO attainment values.

In order to obtain the PO attainment using indirect method, a student exit survey based on the questionnaire of POs may be conducted at end of last semester of the program. The format for the same is given in Table 8. Average of the responses from the outgoing students for each PO is estimated.

The overall PO attainment values are obtained by adding attainment values estimated using direct and indirect methods in the proportion of 80:20 as follows:

Overall attainment value for PO1 =

[0.8 x average attainment value for PO1 using direct method (from table 7)] + [0.2 x average response of outgoing students for PO1].

Similarly overall attainment value can be obtained for each PO.

Table 8: PO Questionnaire for indirect measurement of PO attainment
(For Outgoing students)

At the end of my degree program I am able to do:

Statements of POs	Please Tick any one		
1. Learners will be able to comprehend the acquire knowledge during the Program of study.	3	2	1
2. Learners will be able to reflect on the issues relating to the discipline- 'Education'.	3	2	1

3. Learners will be able to exhibit the professional skills and competencies acquired during the Program of study.	3	2	1
4. Learners will be able to show scientific & research capabilities in their academic, professional and general life pursuits.	3	2	1
5. Learners will be able to apply the knowledge and skills acquired in academic planning, organizing, evaluation, decision making, resource management according to pre-determined objectives/outcomes.	3	2	1
6. Learners will be able to work as member or leader in various teams and multi-disciplinary & diverse settings.	3	2	1
7. Learners will be able to discuss and solve the problems relating to the discipline and life.	3	2	1
8. Learners will be able to state and follow the ethical issues relating to the discipline and society.	3	2	1
9. Learners will be able to apply different tools and techniques of communication and related skills.	3	2	1

Overall PO attainment values can be written as shown in Table 9:

Table 9: Overall PO attainment Values.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
Direct PO attainment									
Indirect PO attainment									
Overall PO attainment.									
Target									

The overall PO attainment values obtained above are compared with set target. The set target for each PO may be different and can be finalized by the staff councils of the departments/institutes. If overall PO attainment value is less than the set target value then an action plan may be prepared for improvement in the subsequent academic session.

The overall PSO attainment level based on CO-PSO mapping values and overall CO attainment values can be obtained in a similar manner as above.

**MASTER OF ART YOGA (M.A YOGA)-TWO YEAR
PROGRAM UNDER CHOICE BASESD CREDIT
SYSTEM (CBCS) W.E.F. 2019-20. LEARNING
OUTCOME BASED CURRICULUM FRAMEWORK
(LOCF) EXAMINATION W.E.F. 2020-21**



KURUKSHETRA UNIVERSITY
KURUKSHETRA
(Established by the State Legislature Act XII of 1956)

Kurukshetra University, Kurukshetra**CBCS Examination Scheme of M. A. Yoga****(Applicable only for UTD from Session 2019-2020)****Semester-1st****Total Credits= 21****Total Marks = 500**

Paper Code	Subjects	Type of Course	Contact Hours Per Week			Credit			Examination Scheme			Total
			Theory	Practical	Total	Theory	Practical	Total	Internal Assessment	Theory	Practical	
M.A YOGA - 101	Fundamentals of Yoga	CCC	04	--	04	04	--	04	20	80	--	100
M.A YOGA - 102	Anatomical and Physiological Aspects of Yoga – I	CFC	04	--	04	04	--	04	20	80	--	100
M.A YOGA - 103	Patanjali Yog Sutra	CCC	04	--	04	04	--	04	20	80	--	100
M.A YOGA - 104	Research Methodology in Yoga	CFC	04	--	04	04	--	04	20	80	--	100
M.A YOGA - 105	<u>Practical -I</u> i) Demonstrations of Basic Asana ii) Basic Pranayam and Shudhi Kriya	CCC	--	5	5	--	5	5	--	--	100	100
Total			16	5	21	16	5	21	80	320	100	500

C.C.C = Compulsory Core Course**C.F.C = Compulsory Foundation Course**

Kurukshetra University, Kurukshetra**CBCS Examination Scheme of M. A. Yoga****(Applicable only for UTD from Session 2019-2020)****Semester-2nd****Total Credits= 23****Total Marks = 550**

Paper Code	Subjects	Type of Course	Contact Hours Per Week			Credit			Examination Scheme			Total
			Theory	Practical	Total	Theory	Practical	Total	Internal Assessment	Theory	Practical	
M.A YOGA -201	Fundamentals of Hatha Yoga	CCC	04	--	04	04	--	04	20	80	--	100
M.A YOGA -202	Anatomical and Physiological Aspects of Yoga – II	CFC	04	--	04	04	--	04	20	80	--	100
M.A YOGA -203	Health Aspects of Yoga	CFC	04	--	04	04	--	04	20	80	--	100
M.A YOGA -204	Applied Statistics in Yoga	CFC	04	--	04	04	--	04	20	80	--	100
M.A YOGA -205	<u>Practical - I</u> i) Demonstrations of Asana, Pranayam and Shudhi Kriya ii) Applied Statistic	CCC	--	5	5	--	5	5	--	--	100	100
M.A YOGA -206	Yoga Parichya/ Mooc (Massive Open Online Courses)	OEC	02	--	02	02	--	02	10	40	--	50
Total			16	5	21	16	5	21	80	320	100	500

Note: The credits and marks of the Open Elective course are not included in the grand total score.*C.C.C = Compulsory Core Course****C.F.C = Compulsory Foundation Course****O.E.C = Open Elective Course**

Kurukshetra University, Kurukshetra
CBCS Examination Scheme of M. A. Yoga
(Applicable only for UTD from Session 2020-2021)
Semester-3rd

Total Credits= 23

Total Marks = 550

Paper Code	Subjects	Type of Course	Contact Hours Per Week			Credit			Examination Scheme			Total
			Theory	Practical	Total	Theory	Practical	Total	Internal Assessment	Theory	Practical	
M.A YOGA -301	Fundamentals of Naturopathy	CCC	04	--	04	04	--	04	20	80	--	100
M.A YOGA -302	Basic Yoga Texts Principle Upanishads & Bhagwat Geeta	CFC	04	--	04	04	--	04	20	80	--	100
M.A YOGA -303	Applications of Yoga	CFC	04	--	04	04	--	04	20	80	--	100
M.A YOGA -304	Applied Psychology in Yoga	CFC	04	--	04	04	--	04	20	80	--	100
M.A YOGA -305	(i) Demonstrations of Asana Pranayam and Shudhi Kriya. (ii) Applied Psychology	CCC	--	5	5	--	5	5	--	--	100	100
M.A YOGA -306	Yoga and Health/ Mooc (Massive Open Online Courses)	OEC	02	--	02	02	--	02	10	40	--	50
Total			16	5	21	16	5	21	80	320	100	500

*Note: The credits and marks of the Open Elective course are not included in the grand total score.

C.C.C = Compulsory Core Course

C.F.C = Compulsory Foundation Course

O.E.C = Open Elective Course

Kurukshetra University, Kurukshetra
CBCS Examination Scheme of M. A. Yoga
(Applicable only for UTD from Session 2020-21)
Semester-4th

Total Credits= 21

Total Marks = 500

Paper Code	Subjects	Type of Course	Contact Hours Per Week			Credit			Examination Scheme			Total
			Theory	Practical	Total	Theory	Practical	Total	Internal Assessment	Theory	Practical	
M.A YOGA - 401	Yoga Therapy	CCC	04	--	04	04	--	04	20	80	--	100
M.A YOGA - 402	Options: i) Food & Nutrition ii) Dissertation	CFC	04	--	04	04	--	04	20	80	--	100
M.A YOGA - 403	Kinesiological Aspect of yoga	CFC	04	--	04	04	--	04	20	80	--	100
M.A YOGA - 404	Teaching Methods of Yoga	CFC	04	--	04	04	--	04	20	80	--	100
M.A YOGA - 405	<u>Practical</u> (i) Demonstrations of Assan Pranayam (ii) Teaching Practices Lesson Plan	CCC	--	5	5	--	5	5	--	--	100	100
Total			16	5	21	16	5	21	80	320	100	500

C.C.C = Compulsory Core Course

C.F.C = Compulsory Foundation Course

M.A Yoga–Syllabus
Modification/Revision in M.A Yoga Syllabus of Semester
C.B.C.S. System w.e.f. 2019-20

The duration of the course leading to the degree of Master of Yoga(M.A Yoga) shall be of four semesters. In the first year, there shall be two semester consisting of eleven courses (5 Courses in Ist Semester + 6 Courses in IInd Semester) in which 9 Theory, including one Open Elective Course & 2 Practicals. In the second/final year there will be two semesters consisting of eleven courses (9 theory courses including one Open Elective course & two Practicals).

Theory papers will be of 100 marks each (80 marks for external evaluation and 20 marks for internal assessment). Dissertation will be of 100 marks (80 marks for Evaluation + 20 marks for internal assessment). Practical will be of 100 marks mentioned according to the Scheme. External and Internal examiners will evaluate dissertation and practical jointly.

Internal Assessment will be based on the guidelines released by University.

In each theory paper, the candidate will be required to attempt five questions, including one compulsory question comprising of 10 short notes, in three hours.

All theory papers in all the four semesters are of four credits and Open Elective Course will have 2 Credits, Consisting of 50 marks (40 for Theory + 10 for internal assessment). Open Elective course will comprise of 2 Units out of which candidates are required to attempt 3 questions in total i.e. 2 Long questions having 16 marks each from each unit (1st & 2nd Unit) and 1 question comprising of 4 short questions having 2 marks for each question covering both the units.

PROGRAMME OUTCOMES:-

1. Learners will be able to comprehend the acquire knowledge during the Programme of study.
2. Learners will be able to reflect on the issues relating to the discipline- 'Education'.
3. Learners will be able to exhibit the professional skills and competencies acquired during the Programme of study.
4. Learners will be able to show scientific & research capabilities in their academic, professional and general life pursuits.
5. Learners will be able to apply the knowledge and skills acquired in academic planning, organizing, evaluation, decision making, resource management according to pre-determined objectives/outcomes.
6. Learners will be able to work as member or leader in various teams and multi-disciplinary & diverse settings.
7. Learners will be able to discuss and solve the problems relating to the discipline and life.
8. Learners will be able to state and follow the ethical issues relating to the discipline and society.
9. Learners will be able to apply different tools and techniques of communication and related skills.

PROGRAMME SPECIFIC OUTCOMES

After completing the programme student- teacher will be able to:-

1. apply and demonstrate various yogic activities, naturopathy techniques and yogic therapies for recovery from diseases and promotions of health.
2. design, analyse, modify nutritional programme in consideration with physiological aspects, health aspects along with Kinesiological aspects that will positively effect yogic performance.
3. apply the basic concept of research process, test and measurement techniques and statistical application for computing results for generalization.
4. demonstrate and apply various psychological techniques and strategies to enhance performance in yoga and other fields of human life while applying best pedagogical techniques.
5. demonstrate and apply different yogic practices such as Aasans, Pranayam and Meditation and Sudhikiryas for the prevention of disease and other health benefits for masses.

M. A. YOGA – 1ST SEMESTER

PAPER – 101: FUNDAMENTALS OF YOGA

Time : 3 Hours

Total Marks : 100 (Theory Marks: 80 + Internal Assessment :20)

Credits=4

Note:- Paper setter will set nine questions in all out of which students will be required to attempt five questions.

- 1. Two long answer type questions will be set from each of four units (1st, IInd, IIIrd & IVth), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 15 marks each.**
- 2. Question No. 9 will be compulsory and will carry 20 marks. It will comprise of 10 short answer type questions of 2 marks each selected from the entire syllabus.**

Course Outcomes: -

After completion of the course contents of this paper, the student will be able to:

- M.A Yoga 101.1** understand the concept of yoga in ancient and modern time application and importance of yoga in modern society.
- M.A Yoga 101.2** enhance the knowledge of different yogic schools like Hatha Yog, Bhakti Yog, Gyan Yog and its types.
- M.A Yoga 101.3** learn about various famous yogis such as Maharishi Patanjali, Guru Ghoraksh Nath, Swami Vivekanand etc. and their contribution in the development of yoga.
- M.A Yoga 101.4** enhance the knowledge about various yoga institutes functioning in India and their contribution towards professional growth of Yoga.

SYLLABUS

Unit-I INTRODUCTION AND EVOLUTION OF YOGA

1. Meaning & Definitions of Yoga according to various schools of thoughts.
2. Historical Background and Development of Yoga.
3. Importance of Yoga in different fields in modern era.
4. Applications and Misconceptions about Yoga in Modern Society.

Unit-II SCHOOLS OF YOGA

1. Hatha Yoga – Aims and Objectives of Hatha Yoga
2. Bhakti Yoga – Types of Bhakti, Navdhabhakti
3. Meaning and Steps of Gyan Yog.
4. Meaning and Types of Mantra Yog.

Unit-III FAMOUS YOGIES

1. Biography of Maharishi Patanjali and his contribution in yoga
2. Biography of Hatha Yogi – Guru Gorakshanath and his contribution in yoga
3. Biography of Swami Vivekananda and his contribution in yoga
4. Biography of Maharishi Aurbindo and his contribution in yoga

Unit-IV INTRODUCTION OF YOGA INSTITUTES IN INDIA

1. Dev Sanskriti Haridwar and its contribution in yoga
2. Gurukul Kangri University, Haridwar and its contribution in yoga
3. Kaivalyadham Lonavla, Pune and its contribution in yoga
4. Bihar Yoga Bharti Yoga Institute Munger, Bihar and its contribution in yoga.

References Books:-

Sharma, J.P. D (2007) manav jivan & yog friends publication, New Delhi
Parmanik T.N. D(2017) Yogkla, sports publication New Delhi
Bhargav, G.M. D (2019) Yoga Education, Sports Publication, New Delhi
Pritam Amrita (2007) Yoga Prichya and parampara, Khel Sahitya Kendra, New Delhi
Yogender D. (2010) Yoga shiksha khel Shitya Kendra, New Delhi
Shukla Atul, D. (2007) Yoga sadna, Khel Shitya Kendra, New Delhi
Parmanik, T.N. D(2018) yoga education sports publication, New Dehli

PAPER – 101: FUNDAMENTALS OF YOGA**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 101.1	3	3	3	3	3	3	3	3	3
M.A Yoga 101.2	3	3	3	3	3	3	3	3	3
M.A Yoga 101.3	3	3	3	3	3	3	3	3	3
M.A Yoga 101.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 101.1	3	3	3	3	3
M.A Yoga 101.2	3	3	3	3	3
M.A Yoga 101.3	3	3	3	3	3
M.A Yoga 101.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 101.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 101.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 101.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 101.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 102: Anatomical and Physiological Aspects of Yoga

Time : 3 Hours

Total Marks : 100 (Theory Marks: 80 + Internal Assessment :20)

Credits=4

Note:- Paper setter will set nine questions in all out of which students will be required to attempt five questions.

1. Two long answer type questions will be set from each of four units (Ist, IInd, IIIrd & IVth), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 15 marks each.
2. Question No. 9 will be compulsory and will carry 20 marks. It will comprise of 10 short answer type questions of 2 marks each selected from the entire syllabus.

Course Outcomes:

After completion of the course contents of this paper, the student will be able to:

- | | |
|-----------------------|---|
| M.A Yoga 102.1 | understand the meaning of Anatomy & physiology, cell structure and functions, Skeletal System and its functions and effect of yogic practices on it. |
| M.A Yoga 102.2 | gain information about muscle property, its mechanism, muscle contraction and muscle fatigue and effects of yogic practices on muscular system. |
| M.A Yoga 102.3 | understand digestive track, digestion and absorption of food and effects of yogic practices on digestive system. |
| M.A Yoga 102.4 | enhance the knowledge of respiratory system, types of respiration , terminology related to respiratory system and effects of yogic practices on respiratory system. |

SYLLABUS

Unit-I GENERAL HUMAN ANATOMY AND PHYSIOLOGY

1. Meaning & Importance of Anatomy & Physiology.
2. Structure of Cell, Function of Cell and Tissue.
3. Skeletal System – Name and structure of all bones and joints of human body.
4. Effect of Yogic Practices on Skeletal System.

Unit-II MUSCULAR SYSTEM

1. Types and structure of muscle. Properties of Muscle.
2. Elementary knowledge of muscle contraction and muscle tone
3. Mechanism of Muscles Fatigue
4. Effect of Yogic Practices on Muscular System.

Unit-III DIGESTIVE SYSTEM

1. Structure of digestive tract and organs of digestive tract
2. Role of each digestive organ in digestion of food.
3. Physiology of food digestion and absorption.
4. Effect of Yogic Practices on Digestive System.

Unit-IV RESPIRATORY SYSTEM

1. Structure and functions of respiratory organs.
2. Physiology of external and internal respiration.
3. Elementary knowledge of various respiratory volumes & capacities.
4. Effect of yogic practices on respiratory system.

References Books:-

Amrit Kumar, R, Moses. (1995). Introduction to Exercise Physiology. Madras: Poompugar Pathipagam.
Beotra Alka, (2000) Drug Education Handbook on Drug Abuse in Sport: Sport Authority of India Delhi.
Clarke, D.H. (1975). Exercise Physiology. New Jersey: Prentice Hall Inc., Englewood Cliffs.
David, L Costill. (2004). Physiology of Sport and Exercise. Human Kinetics.
Fox, E.L., and Mathews, D.K. (1981). The Physiological Basis of Physical Education and Athletics. Philadelphia: Sanders College Publishing.
Guyton, A.C. (1976). Textbook of Medical Physiology. Philadelphia: W.B. Sanders co. Richard, W. Bowers. (1989). Sport Physiology. WMC: Brown Publishers.
Sandhya Tiwaji. (1999). Exercise Physiology. Sport Publishers.
Shaver, L. (1981). Essentials of Exercise Physiology. New Delhi: Subject Publications. Vincent, T. Murche. (2007). Elementary Physiology. Hyderabad: Sport Publication. William, D. Mc Aradle. (1996). Exercise Physiology, Energy, Nutrition and Human Performance. Philadelphia: Lippincott Williams and Wilkins Company.

PAPER – 102: Anatomical and Physiological Aspects of Yoga**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 102.1	3	3	3	3	3	3	3	3	3
M.A Yoga 102.2	3	3	3	3	3	3	3	3	3
M.A Yoga 102.3	3	3	3	3	3	3	3	3	3
M.A Yoga 102.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 102.1	3	3	3	3	3
M.A Yoga 102.2	3	3	3	3	3
M.A Yoga 102.3	3	3	3	3	3
M.A Yoga 102.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 102.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 102.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 102.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 102.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 103 PATANJALI YOGSUTRA

Time : 3 Hours

Total Marks : 100 (Theory Marks: 80 + Internal Assessment :20)

Credits=4

Note:- Paper setter will set nine questions in all out of which students will be required to attempt five questions.

- 1. Two long answer type questions will be set from each of four units (1st, IInd, IIIrd & IVth), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 15 marks each.**
- 2. Question No. 9 will be compulsory and will carry 20 marks. It will comprises of 10 short answer type questions of 2 marks each selected from the entire syllabus.**

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- M.A Yoga 103.1** enhance knowledge about historical background, importance and relevance of Patanjali Yog Sutra in modern age.
- M.A Yoga 103.2** develop concept of Chit Vritti, Chitta Bhoomi, and Sabeej, Nirbeej Samadhi.
- M.A Yoga 103.3** understand the knowledge about Kriya Yog, Panchklesha, Antrang and Bahirang Sadhna.
- M.A Yoga 103.4** understand about various Siddhies, Karamas and concept of Kaivalya.

SYLLABUS

Unit – I INTRODUCTION OF PATANJALI YOGA SUTRAS

1. Historical Background of Patanjali Yoga Sutra.
2. Importance of Patanjali Yoga Sutras in Modern Age.
3. Patanjali Yoga as a Science.
4. Physical Mental and Social Excellence in Yoga Sutra.

Unit – II SAMADHI PADA

1. Meaning and Definition of Yoga Concept of Chitta, Chit Vritti and Chitta Bhumi
2. Abhyas Varagya, Yog Antraya, Ishwar Swaroop and Vivek Khyati.
3. Chitta Vikshep and Chitt Prasadhan.
4. Samadhi- Sampragyat Samadhi and Ritambhara Prayga. Concept of Sabeej and Nirbeej.

Unit – III SADHAN AND VIBHUTI PADA

1. Kriya Yoga and Panch Klesha : Avidhya, Asmita, Raag, Devasha and Abhinivesha
2. Ashtang Yoga (Bahirang Sadhana) – Yama, Niyam, Asana, Pranayam and Pratyahar
3. Ashtang Yoga (Antrang Sadhana) – Dharana, Dhyana and Samadhi
4. Samyama, Yoga Vibhootis and Ashtsiddhis

Unit – IV KAIVALYA PADA

1. Types of Sidhis.
2. Concept of Dharmamegh Samadhi
3. Brief introduction of Karma, Types of Karma and Karmaphal Siddhanta
4. Concept of Kaivalya

References Books:-

- George Feuerstein, (1975). *Text Book of Yoga*. London: Motilal Bansaridass Publishers (P) Ltd.
- Gore, (1990), *Anatomy and Physiology of Yogic Practices*. Lonavata: Kanchan Prakashan. Helen Purperhart (2004), *The Yoga Adventure for Children*. Netherlands: A Hunter House book.
- Iyengar, B.K.S. (2000), *Light on Yoga*. New Delhi: Harper Collins Publishers.
- Karbelkar N.V.(1993) *Patanjal Yogasutra Bhashya (Marathi Edition)* Amravati: Hanuman Vyayam Prasarak Mandal
- Kenghe. C.T. (1976). *Yoga as Depth-Psychology and para-Psychology (Vol-I): Historical Background*, Varanasi: Bharata Manishai.
- Kuvalyananada Swami & S.L. Vinekar, (1963), *Yogic Therapy – Basic Principles and Methods*. New Delhi: Govt. of India, Central Health Education and Bureau.
- Moorthy A.M. & Alagesan. S. (2004) *Yoga Therapy*. Coimbatore: Teachers Publication House.
- Swami Kuvalayanda, (1998), *Asanas*. Lonavala: Kaivalyadhama.
- Swami Satyananada Sarasvati. (1989), *Asana Pranayama Mudra Bandha*. Munger: Bihar School of Yoga.
- Swami Satyananda Saraswathi. (1984), *Kundalini and Tantra*, Bihar: Yoga Publications Trust.
- Swami Sivananda, (1971), *The Science of Pranayama*. Chennai: A Divine Life Society Publication.
- Thirumalai Kumar. S and Indira. S (2011) *Yoga in Your Life*, Chennai: The Parkar Publication.
- Tiwari O.P. (1998), *Asanas-Why and How*. Lonavala: Kaivalyadham.

PAPER – 103 PATANJALI YOG SUTRA**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 103.1	3	3	3	3	3	3	3	3	3
M.A Yoga 103.2	3	3	3	3	3	3	3	3	3
M.A Yoga 103.3	3	3	3	3	3	3	3	3	3
M.A Yoga 103.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 103.1	3	3	3	3	3
M.A Yoga 103.2	3	3	3	3	3
M.A Yoga 103.3	3	3	3	3	3
M.A Yoga 103.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 103.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 103.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 103.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 103.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 104 - Research Methodology in Yoga

Time : 3 Hours

Maximum Marks: 100 (Theory: 80 + Internal Assessment – 20)

Credits=4

Note:- Paper setter will set nine questions in all out of which students will be required to attempt five questions.

1. Two long answer type questions will be set from each of four units (Ist, IInd, IIIrd & IVth), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 15 marks each.
2. Question No. 9 will be compulsory and will carry 20 marks. It will comprise of 10 short answer type questions of 2 marks each selected from the entire syllabus.

Course Outcomes:-

After completing the course contents, the students will be able to:-

- | | |
|-----------------------|---|
| M.A Yoga 104.1 | understand the meaning, need, types of research and research problem and its selection criteria in Yoga. |
| M.A Yoga 104.2 | understand the meaning, importance and types of sampling, methods and framing of hypothesis in yoga. |
| M.A Yoga 104.3 | understand the meaning and need of survey of related literature, research proposal, format of synopsis and types of variables |
| M.A Yoga 104.4 | apply knowledge of research report, its chapterization, writing bibliography in research with ethical issues. |

SYLLABUS

Unit – I: Introduction

1. Meaning and Definition of Research. Need of Research in Yoga
2. Types of Research: Analytical, Descriptive, Experimental, Qualitative and Meta Analysis.
3. Research Problem: Meaning of Research Problem, location of research problem, criteria for Selection of Research Problem.
4. Delimitation and limitations of research problem

UNIT II – Concept of Sampling and Hypothesis

1. Meaning and Definition of Sample and Population.
2. Types of sampling methods: Probability Sampling Methods and Non – Probability Sampling Methods.
3. Meaning and definition of Hypothesis, Importance Hypothesis in research,
4. Types of Hypothesis, Type 1 and Type 2 errors in Hypothesis testing.

UNIT-III Review of related literature

1. Meaning and need for survey of related literature, Literature Sources – Primary and Secondary sources, Steps in Literature Search. Method for writing of Literature review.
2. Variables: Meaning and Definition of Variables, types of variables: Dependent, Independent, Control, Extraneous, Moderator and Predictor.
3. Research Proposal: Meaning and Significance of Research Proposal, Steps of preparing Research proposal/synopsis,
4. Format of a synopsis

Unit – IV Research Report

1. Research Report: Details of Chapterization of Thesis/ Dissertation,
2. Method of writing abstract, method of writing full paper for presenting in a conference and to publish in journals.
3. Technicalities of writing: Footnote and Bibliography.
4. Ethical Issues in Research: Areas of Dishonesty in research.

References Books:-

Best J. W (1971) Research in Education, New Jersey; Prentice Hall, Inc
Clarke David. H & Clarke H, Harrison (1984) Research processes in Physical Education, New Jersey; Prentice Hall Inc.
Craig Williams and Chris Wragg (2006) Data Analysis and Research for Sport and Exercise Science, London; Routledge Press
Jerry R Thomas & Jack K Nelson (2000) Research Methods in Physical Activities; Illinois; Human Kinetics;
Kamlesh, M. L. (1999) Research Methodology in Physical Education and Sports, New Delhi; Moses, A. K. (1995) Thesis Writing Format, Chennai; Poompugar Pathippagam

PAPER – 104 - Research Methodology in Yoga**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 104.1	3	3	3	3	3	3	3	3	3
M.A Yoga 104.2	3	3	3	3	3	3	3	3	3
M.A Yoga 104.3	3	3	3	3	3	3	3	3	3
M.A Yoga 104.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 104.1	3	3	3	3	3
M.A Yoga 104.2	3	3	3	3	3
M.A Yoga 104.3	3	3	3	3	3
M.A Yoga 104.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 104.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 104.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 104.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 104.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 105 PRACTICAL SYLLABUS (Part-i & ii)

Credits=5

Maximum Marks: 100

Part (i) Marks: 50

Part (ii) Marks: 50

Course Outcomes:-

After completing the course contents, students will be able to:

- M.A Yoga 105.1** apply and demonstrate of Surya Namaskar Cultural Asanas, Meditative Asanas and Relaxative Asanas.
- M.A Yoga 105.2** apply and demonstrate techniques of different Asanas and their effects on human body.
- M.A Yoga 105.3** calculate mean, median, standard deviation with help of Excel and SPSS.
- M.A Yoga 105.4** apply t-test, ANOVA, Co-relation & Graphical representation with help of Excel and SPSS.

Syllabus of Part (i)

1. PRAYER, SANKALPMANTRA
2. SURYA NAMASKARA-12 ROUNDS
3. PAWANMUKTASANA SERIES-I
4. SUKSHAMA VYAYAMA
5. MEDITATIVE ASANAS
6. Padmasan, Siddhasan, Vajarasana
1. RELAXATIVE ASANAS:
Shavasana, Makarasana
2. SUPINE LYING ASANAS:
Naukasana, Setubandhasana, Pawanmuktasana, Vipareetkaraniyasana, Ardhalasana, Simplematsyasana
3. PRONE LYING ASANAS:
Bhujangasana, Ardhalasana, Niralambasana
4. SITTING ASANAS:
 1. Janushirasana, Vakrasana, Mandukasana, Yog Mudra Shashankasana
 2. Ardhaushtrasana, Uttan Mandukasana, Parvatasana
5. STANDING ASANAS:
Tadasana, Natarajasana, Garudasana, Katichakrasana

6. STRETCHING PRACTICE

Syllabus of Part (i)

Following statistical techniques with Excel & SPSS

- | | |
|---|--------------|
| i) Calculation of Mean, Median & Standard Deviation | (Marks = 10) |
| ii) t - test, ANOVA & Correlation | (Marks = 10) |
| iii) Plotting different types of graphs | (Marks = 10) |

PAPER – 105 PRACTICAL SYLLABUS (PART-i & ii)**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 105.1	3	3	3	3	3	3	3	3	3
M.A Yoga 105.2	3	3	3	3	3	3	3	3	3
M.A Yoga 105.3	3	3	3	3	3	3	3	3	3
M.A Yoga 105.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 105.1	3	3	3	3	3
M.A Yoga 105.2	3	3	3	3	3
M.A Yoga 105.3	3	3	3	3	3
M.A Yoga 105.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 105.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 105.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 105.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 105.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

M. A. YOGA – 2nd SEMESTER

PAPER – 201 FUNDAMENTALS OF HATHA YOGA

Time: 3 Hours

Total Marks: 100 (Theory Marks: 80 + Internal Assessment: 20)

Credits=4

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- | | |
|----------------------|---|
| M.A Yoga201.1 | understand the meaning of Hath yoga and concept of Mitahara, Pathya, Apathya, introduction of Asanas, Bandha, Mudra and meaning principles types and techniques of Asanas and Shatkarmas. |
| M.A Yoga201.2 | understand the meaning , types, techniques of Kumbhaka, Chakras, Kundalini, Nadis, Samadhies and Nadanusandhana. |
| M.A Yoga201.3 | understand the introduction, history, concept of Ghatasth Yoga, Shatkarmas, Asanas and Mudras according to Gheranda Samhita. |
| M.A Yoga201.4 | apply and demonstrate Pratyahara, Pranayamas, Dyan, Smadhi. |

SYLLABUS

Unit – I INTRODUCTION OF HATHAPRADIPIKA

1. Definitions of Hatha Yoga – Time and Place, Dress Code & Environment for Hatha Yoga practice
2. Concept of Mitahara, Pathya and Apathya
3. Introduction of Asanas, Mudra, Bandh & Concept of Nadis
4. Asana and Shatkarmas – Meaning, Definitions, Principles, Types, Technique, Precautions and Benefits.

Unit – II KUMBHAKA, MUDRAS, BANDHAS, NADANUSANDHANA

1. Kumbhaka – Meaning, Definition, Types of Kumbhaka, Technique, Precautions & Benefits
2. Mudras and Bandhas – Meaning, Definition, Technique, Precautions and Benefits
3. Chakras, Kundalini and Nadis
4. Nadanusandhana and Various types of Samadhis.

Unit – III INTRODUCTION OF GHERANDA SAMHITA

1. Introduction and History of Gheranda Samhita.
2. Concept of Ghatasth Yoga. Saptasadhana:- Shatkarma, Asanas, Pranyama, Pratyahara, Mudra, Dhyana, Smadhi
3. Shatkarma – Meaning Types (Dhauti, Basti, Neti, Trataka, Nauli and Kapalabhati), Technique,
4. Precautions and Benefits.
5. Asanas and Mudras – Meaning, Definition, Types, Technique, Precautions and Benefits.

Unit – IV PRATYAHARA AND PRANAYAMAS

1. Pratyahara – Meaning, Types, Technique, Precautions and Benefits
2. Pranayamas – Meaning and Definition, Types, Technique, Precautions and Benefits.
3. Dhayana – Meaning, Types, Technique, Precautions and Benefits.
4. Samadhi – Meaning, Types, Technique, Precautions and Benefits.

References Books:-

- “George Feuerstein, (1975). *Text Book of Yoga*. London: Motilal Bansaridass Publishers (P) Ltd.
- Gore, (1990), *Anatomy and Physiology of Yogic Practices*. Lonavata: Kanchan Prakashan.
- Helen Purperhart (2004), *The Yoga Adventure for Children*. Netherlands: A Hunter House book.
- Iyengar, B.K.S. (2000), *Light on Yoga*. New Delhi: Harper Collins Publishers.
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- Kenghe. C.T. (1976). *Yoga as Depth-Psychology and para-Psychology (Vol-I): Historical Background*, Varanasi: Bharata Manishai.
- Kuvalyananada Swami & S.L. Vinekar, (1963), *Yogic Therapy – Basic Principles and Methods*. New Delhi: Govt. of India, Central Health Education and Bureau.
- Moorthy A.M. & Alagesan. S. (2004) *Yoga Therapy*. Coimbatore: Teachers Publication House.
- Swami Kuvalayanda, (1998), *Asanas*. Lonavala: Kaivalyadhama.
- Swami Satyananada Sarasvati. (1989), *Asana Pranayama Mudra Bandha*. Munger: Bihar School of Yoga.
- Swami Satyananda Saraswathi. (1984), *Kundalini and Tantra*, Bihar: Yoga Publications Trust.
- Swami Sivananda, (1971), *The Science of Pranayama*. Chennai: A Divine Life Society Publication.
- Thirumalai Kumar. S and Indira. S (2011) *Yoga in Your Life*, Chennai: The Parkar Publication.
- Tiwari O.P. (1998), *Asanas-Why and How*. Lonavala: Kaivalyadham.

PAPER – 201 FUNDAMENTALS OF HATHA YOGA**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga201.1	3	3	3	3	3	3	3	3	3
M.A Yoga201.2	3	3	3	3	3	3	3	3	3
M.A Yoga201.3	3	3	3	3	3	3	3	3	3
M.A Yoga201.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 201.1	3	3	3	3	3
M.A Yoga 201.2	3	3	3	3	3
M.A Yoga 201.3	3	3	3	3	3
M.A Yoga 201.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 201.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 201.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 201.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 201.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 202 ANATOMICAL AND PHYSIOLOGICAL ASPECTS OF YOGA

Time : 3 Hours

Total Marks : 100 (Theory Marks: 80 + Internal Assessment :20)

Credits=4

Note:- Paper setter will set nine questions in all out of which students will be required to attempt five questions.

- 1. Two long answer type questions will be set from each of four units (1st, IInd, IIIrd & IVth), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 15 marks each.**
- 2. Question No. 9 will be compulsory and will carry 20 marks. It will comprises of 10 short answer type questions of 2 marks each selected from the entire syllabus.**

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- | | |
|------------------------|---|
| M.A Yoga 202.1. | enhance knowledge of Cardio-Vascular System, structure, functions and process and types of blood circulation and effects of yogic activities on Cardio-Vascular System. |
| M.A Yoga 202.2 | enhance knowledge of nervous system, its classification, functions and effect of yogic activities on nervous system. |
| M.A Yoga 202.3 | enhance knowledge of origins of Excretory System, their structure, physiology and effects of yogic practices on Excretory System. |
| M.A Yoga 202.4 | understand the knowledge of glands, types of glands, their hormones and secretion and effect of yogic practices on Endocrine Glands. |

SYLLABUS

Unit-I Cardio-Vascular System:

1. Structure & Functions of Heart.
2. Blood and its composition, functions of blood.
3. Types of Blood circulations: Systemic and Pulmonary
4. Effect of Yogic Practice on Cardio-Vascular System.

Unit-II Nervous System:

1. Introduction of Nervous System Organs.
2. Types of Nervous Systems: Central, Peripheral & Autonomic nervous system.
3. Effect of Yogic Practice on Nervous System.
4. Structure & functions of nose, ears and eyes. Effect of Yoga on nose, ears and eyes

Unit-III Excretory System

1. Organs of excretory system.
2. Structure of Kidney and Skin
3. Structure of nephron and physiology of the formation of urine.
4. Effect of Yogic Practices on Kidney and Skin

Unit-IV Endocrine System:

1. Meaning of Endocrine glands, Name and location of endocrine glands.
2. Hormones secretions from pituitary, thyroid, parathyroid, pancreas and adrenal gland
3. and their functions in body.
4. Meaning of Hormone and enzyme and their differentiation.
5. Effect of yogic practices on Endocrine glands and their secretions.

References Books:-

- Amrit Kumar, R, Moses. (1995). Introduction to Exercise Physiology. Madras: Poompugar Pathipagam.*
- Beotra Alka, (2000) Drug Education Handbook on Drug Abuse in Sport: Sport Authority of India Delhi.*
- Clarke, D.H. (1975). Exercise Physiology. New Jersey: Prentice Hall Inc., Englewood Cliffs.*
- David, L Costill. (2004). Physiology of Sport and Exercise. Human Kinetics.*
- Fox, E.L., and Mathews, D.K. (1981). The Physiological Basis of Physical Education and Athletics. Philadelphia: Sanders College Publishing.*
- Guyton, A.C. (1976). Textbook of Medical Physiology. Philadelphia: W.B. Sanders co. Richard, W. Bowers. (1989). Sport Physiology. WMC: Brown Publishers.*

PAPER – 202 ANATOMICAL AND PHYSIOLOGICAL ASPECTS OF YOGA**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 202.1	3	3	3	3	3	3	3	3	3
M.A Yoga 202.2	3	3	3	3	3	3	3	3	3
M.A Yoga 202.3	3	3	3	3	3	3	3	3	3
M.A Yoga 202.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga202.1	3	3	3	3	3
M.A Yoga 202.2	3	3	3	3	3
M.A Yoga 202.3	3	3	3	3	3
M.A Yoga 202.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 202.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 202.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 202.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 202.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 203 HEALTH ASPECTS OF YOGA

Time : 3 Hours

Total Marks : 100 (Theory Marks: 80 + Internal Assessment :20)

Credits=4

Note:- Paper setter will set nine questions in all out of which students will be required to attempt five questions.

1. Two long answer type questions will be set from each of four units (1st, IInd, IIIrd & IVth), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 15 marks each.
2. Question No. 9 will be compulsory and will carry 20 marks. It will comprises of 10 short answer type questions of 2 marks each selected from the entire syllabus.

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- | | |
|-----------------------|--|
| M.A Yoga 203.1 | develop concept of health, its dimensions, health services, guidance, personal hygiene and diseases in Indian system of Ayurveda. |
| M.A Yoga 203.2 | apply and demonstrate yogic practices i.e. Asanas, Prayanamas, Shatkarmas and Bandha for enhancing health. |
| M.A Yoga 203.3 | Understand meaning of mental health and mental disorders i.e. conflict, frustration, depressive disorders, anxiety disorders and their causes and healing through yogic practices. |
| M.A Yoga 203.4 | develop concept of diets including yogic diet for the health promotions. |

SYLLABUS

Unit-I Introduction of Health & Yoga

1. Meaning, Definition according to WHO & Importance of Health.
2. Dimensions of Health Physical, Mental, Social and Spiritual.
3. Concept of Health & Diseases in Indian Systems of Ayurveda.
4. Health Services and Guidance Instruction in Personal Hygiene.

Unit-II Role of Yoga in Health Care

1. Role of Yoga in Preventing Health Care.
2. Asana & Health, Pranayam & Health.
3. Shatkarmas & Health, Mudra/Bandh & Health.
4. Concept of Trigunas, Panch-mahabhutas, Panch- pran & Role in Health and Healing.

Unit-III Yoga & Mental Health

1. Meaning of Styana, Samshaya, Pramada, Avirati, Bhranti Darsana, Alabdha – Bhumikatva, Anavasthitatva, Dukha and Daurmanasy.
2. Meaning of Mental Health and Positive Mental Health.
3. Causes and Consequences of Conflict and Frustration.
4. Healing through Yoga : Mental Disorders, Depressive Disorders, Anxiety Disorders and Serious Mental Disorders.

Unit-IV Yoga & Diet

1. Diet: Before and after yogic practices.
2. Concept and contents of Balance Diet, Yogic Diet and Moderation of Diet.
3. Concept of Vegetarian Diet, Useful Effect of Vegetarian Diet.
4. Harmful Effects of Non-Vegetarian Diet.

References Books:-

Gore C.S (2011) Yoga & health sports publication New Delhi

Srivastava A.K. (2010) health and yoga sports publication New Delhi

Singh Balbir Malik Satish (2018) health education and environmental studies sports publication, New Delhi

Verma K.K. Swastya Shiksha Parkash Borthers Ludiana

Kumar Amresh (2008) Paranayam & Health, Khel Shitya Kendra, New Delhi

PAPER – 203 HEALTH ASPECTS OF YOGA**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 203.1	3	3	3	3	3	3	3	3	3
M.A Yoga 203.2	3	3	3	3	3	3	3	3	3
M.A Yoga 203.3	3	3	3	3	3	3	3	3	3
M.A Yoga 203.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga203.1	3	3	3	3	3
M.A Yoga 203.2	3	3	3	3	3
M.A Yoga 203.3	3	3	3	3	3
M.A Yoga 203.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 203.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 203.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 203.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 203.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 204 – APPLIED STATISTICS IN YOGA

Time : 3 Hours

Total Marks : 100 (Theory Marks: 80 + Internal Assessment :20)

Credits=4

Note:- Paper setter will set nine questions in all out of which students will be required to attempt five questions.

1. Two long answer type questions will be set from each of four units (1st, IInd, IIIrd & IVth), out of which the students will be required to attempt one question from each unit. Long answer type question will carry 15 marks each.
2. Question No. 9 will be compulsory and will carry 20 marks. It will comprises of 10 short answer type questions of 2 marks each selected from the entire syllabus.

Course Outcomes:-

After undergoing the course contents of this paper, the students will be able to:

- | | |
|----------------------|--|
| M.A Yoga204.1 | understand the meaning , need and importance of statistics and concept of data and measures of central tendency its merit and limitations. |
| M.A Yoga204.2 | understand and demonstrate variability, quartile deviation, percentile & quartile with computation, percentile, rank & its computation. |
| M.A Yoga204.3 | apply computation of probability curve, Meaning & type of skewness & kurtosis, Calculation of probability, meaning, types, and computation of correlation. |
| M.A Yoga204.4 | understand and apply meaning, advantage and types of graphical representation of data & meaning of two tailed, t-test and Anova testing. |

SYLLABUS

Unit – I: Introduction to Statistics and Measures of Central Tendency

1. Meaning of Statistics. Need and importance of statistics in Yoga
2. Meaning of Data, Methods of organizing Data through Frequency Distribution.
3. Meaning of the Measures of Central Tendency, Computation Mean, Median and Mode.
4. Merits and limitations of Mean, Median and Mode

Unit-II: Introduction of Variability

1. Meaning of measures of variability: Range, Quartile Deviation, Average Deviation and Standard Deviation.
2. Computation of Range, Quartile Deviation, Average Deviation and Standard Deviation.
3. Meaning of term Percentile and Quartiles Deviation. Computation of Percentile and Quartiles Deviation
4. Meaning of term Percentile Rank and Computation of Percentile Rank.

Unit – III: Introduction to Normal Probability Curve and Correlation

1. Meaning of Normal Probability Curve and Properties of Normal Curve.
2. Meaning and types of Skewness and kurtosis. Sigma Scores and T – Scores.
3. Meaning and Types of Linear Correlation.
4. Computation of Correlation Coefficient with Product Movement and Rank Difference Method.

Unit – IV: Graphical representation of data and testing of Hypothesis

1. Meaning and advantage of Graphical Representation of Data.
2. Types of Bar Diagrams, Method of preparing Histogram, Frequency Polygon, Cumulative-Frequency Graph, Bar-Diagram and Pie Diagram.
3. Meaning of two – tailed and one tailed test of significance,
4. Computing significance of difference between two means with t – Test (independent samples) and One way ANOVA Test.

REFERENCES:

Clarke.HH.The Application of Measurement in Health and Physical Education,1992. Clarke,David H.and Clake H.Hares N. Research Process in Health Education Physical Education and Recreation . Englewood Cliffs, New Jersey, Prentice Hall, Inc.1986. Shaw. Dhananjoy. Fundamental statistics in Physical Education & Sports sciences, sports publication,2007.

Margaret J. Safrit : Introduction to Measurement in Physical Education and Exercise Science, Time Mirror/ Mosy, College Publishing St. Louis. Toronte Bosion (2Nd. Edition-1998.

Morey E. Garrett : Statistics in Psychology and Educated, David Meka Company Inc.

Devinder K. Kansal : Test and Measurement in Sports and Physical Education, D.V.S.Publications, Kalkaji, New Delhi –110019.

PAPER – 204 – APPLIED STATISTICS IN YOGA**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga204.1	3	3	3	3	3	3	3	3	3
M.A Yoga 204.2	3	3	3	3	3	3	3	3	3
M.A Yoga 204.3	3	3	3	3	3	3	3	3	3
M.A Yoga 204.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga204.1	1	3	3	3	3
M.A Yoga 204.2	1	3	3	3	3
M.A Yoga 204.3	1	3	3	3	3
M.A Yoga 204.4	1	3	3	3	3
Average	1	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 204.1	3	3	3	3	3	3	3	3	3	1	3	3	3	3
M.A Yoga 204.2	3	3	3	3	3	3	3	3	3	1	3	3	3	3
M.A Yoga 204.3	3	3	3	3	3	3	3	3	3	1	3	3	3	3
M.A Yoga 204.4	3	3	3	3	3	3	3	3	3	1	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	1	3	3	3	3

PAPER – 205 PRACTICAL SYLLABUS (Part i & ii)

Credits=5

Maximum Marks: 100

Part (i) Marks:70

Part (ii) Marks:30

Course Outcomes:-

After completing the course contents, students will be able to:

- | | |
|----------------------|---|
| M.A Yoga205.1 | apply and demonstrate of Surya Namaskar , Asanas, Pranayamas and Sudhi Kriyas. |
| M.A Yoga205.2 | apply and demonstrate techniques of different yogic activities and their effects on human body. |
| M.A Yoga205.3 | calculate mean, median, standard deviation with help of Excel and SPSS. |
| M.A Yoga205.4 | apply t-test, ANOVA, Co-relation & Graphical representation with help of Excel and SPSS. |

SYLLABUS

(i) Demonstrations of Asana, Pranayam and Shudhi Kriya

1. SURYA NAMASKARA - 12 ROUNDS
2. SUKSHAMA VYAYAMA
3. MEDITATIVE ASANAS: Padmasan, Siddhasan, Vajarasana
4. RELAXATIVE ASANAS: Shavasana, Makarasana
5. SUPINE LYING ASANAS: Sarvangasana, Halasana, Chakrasana, Uttanpadasana
6. PRONE LYING ASANAS: Bhujangasana, Ardha Shalabhasana, Niralambasana
7. SITTING ASANAS: Paschimottasana, Matsyandarsana, Shashankasana, Ushtrasana, Suptavajrasana
8. STANDING ASANAS: Tadasana, Vrikshasana, Konasana, Padhasana
9. PRANAYAMA: Nadi Shodhan Pranayama, Setkari Pranayama, Bhastrika Pranayama, Bhramari
10. BANDHA: Jalandhar Bandha, Uddiyana Bandha, Mool Bandha
11. MUDRA: Gyan Mudra, Pranayami Mudra, Vipritkarni Mudra
12. SHATKARMA:
 - a) NETI : Two types (Jal Neti and Rubber Neti)
 - b) DHOUTI : Two Types (Kunjali Kriya and Agnisar Kriya)
 - c) KAPALBHATI : Vaatkarma, Sheetkarma
 - d) TRATAK
13. MEDITATION – Om recitation
14. RELAXATION TECHNIQUES – Shavasana, Yog Nidra,
15. PRACTICAL NOTE BOOK

(ii) APPLIED STATISTICS

- | | |
|---|--------------|
| i) Calculation of Mean, Median & Standard Deviation | (Marks = 10) |
| ii) t - test, ANOVA & Correlation | (Marks = 10) |
| iii) Plotting different types of graphs | (Marks = 10) |

PAPER – 205 – PRACTICAL SYLLABUS (Part i & ii)**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga205.1	3	3	3	3	3	3	3	3	3
M.A Yoga 205.2	3	3	3	3	3	3	3	3	3
M.A Yoga 205.3	3	3	3	3	3	3	3	3	3
M.A Yoga 205.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga205.1	3	3	3	3	3
M.A Yoga 205.2	3	3	3	3	3
M.A Yoga 205.3	3	3	3	3	3
M.A Yoga 205.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga205.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 205.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 205.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 205.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Open Elective

PAPER-206: YOGA PRICHAYA

Time: Two Hours

Total Marks: 50 (Theory Marks: 40 + Internal Assessment: 10)

Note: Paper setter is required to set 2 questions from each Unit – I and II. Unit - III consists of 4 questions of short answers distributed from all over the syllabus. The candidates are required to attempt one question from each Unit – I and II carrying 16 marks for each question. Unit - III is compulsory for all consisting 2 marks of each short answer.

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- M.A Yoga 206.1** understand the meaning, historical background various types of yoga, need, importance and misconception about yoga in modern life.
- M.A Yoga 206.2** apply and demonstrate various yogic practices such as Asanas, Pranayamas, meditation, Bandha and Mudras and Shudhikriyas along with their processes and benefits.

SYLLABUS

Unit – I: Introduction of yoga and its elements.

1. Meaning, Definition and historical background of Yoga
2. The Astanga Yoga:Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana and Samadhi
3. Yoga in the Bhagavadgita - Karma Yoga, Raja Yoga, Gyan Yoga and Bhakti Yoga.
4. Need and Importance of Yoga in modern life.
5. Misconceptions about Yoga.

Unit - II Yogic activities: Asanas, Pranayamas & Shudhikriyas.

1. Meaning and types of Asana: Cultural,Relaxative & Meditative.
2. Meaning and types of Pranayama: Suryabhedan,Ujjai, Sheetal, Sheetkari, Bhramari & Bhastrika.
3. Meaning and types of Shudhikriyas: Neti, Dhoti, Basti, Neoli, Tratak & Kapalbhati.
4. Meaning and types of Bandhas: Jalandhar Mool & Udiyan.
5. Meditation and its processes.

References:

George Feuerstein, (1975). *Text Book of Yoga*. London: Motilal Bansaridass Publishers (P) Ltd.

Gore, (1990), *Anatomy and Physiology of Yogic Practices*. Lonavata: Kanchan Prakashan.

Helen Purperhart (2004), *The Yoga Adventure for Children*. Netherlands: A Hunter House book.

Iyengar, B.K.S. (2000), *Light on Yoga*. New Delhi: Harper Collins Publishers.

Karbelkar N.V.(1993) *Patanjal Yogasutra Bhashya (Marathi Edition)* Amravati: Hanuman Vyayam Prasarak Mandal

Kenghe. C.T. (1976). *Yoga as Depth-Psychology and para-Psychology (Vol-I): Historical Background*, Varanasi:

Bharata Manishai.

Kuvalyananada Swami & S.L. Vinekar, (1963), Yogic Therapy – Basic Principles and Methods. New Delhi: Govt. of India, Central Health Education and Bureau.

Moorthy A.M. & Alagesan. S. (2004) Yoga Therapy. Coimbatore: Teachers Publication House.

Swami Kuvalayanda, (1998), Asanas. Lonavala: Kaivalyadhama.

Swami Satyananada Sarasvati. (1989), Asana Pranayama Mudra Bandha. Munger: Bihar School of Yoga.

Swami Satyananda Saraswathi. (1984), Kundalini and Tantra, Bihar: Yoga Publications Trust.

Swami Sivananda, (1971), The Science of Pranayama. Chennai: A Divine Life Society Publication.

Thirumalai Kumar. S and Indira. S (2011) Yoga in Your Life, Chennai: The Parkar Publication.

Tiwari O.P. (1998), Asanas-Why and How. Lonavala: Kaivalyadham

PAPER-206: YOGA PRICHAYA (OPEN ELECTIVE)**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 206.1	3	3	3	3	3	3	3	3	3
M.A Yoga 206.2	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga206.1	3	3	3	3	3
M.A Yoga 206.2	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 206.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 206.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

M. A. YOGA – 3rd SEMESTER

PAPER – 301: Fundamentals of Naturopathy

Time: 3 Hours

Total Marks: 100 (Theory Marks: 80 + Internal Assessment: 20)

Credits=4

Note: Paper setter is required to set 2 questions from each Unit - I, II, III and IV. Unit - V consists of 10 questions of short answers distributed from all over the syllabus. The candidates are required to attempt one question from each Unit – I, II, III & IV carrying 15 marks for each question. Unit - V is compulsory for all consisting 2 marks of each short answer.

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- M.A Yoga301.1** understand the meaning and definition, principles of Naturopathy and Swasthya Vritam and relations between Naturopathy and Allopathy.
- M.A Yoga301.2** understand the meaning, principles and benefits of Hydrotherapy in treating different ailments.
- M.A Yoga301.3** understand the meaning, classification and uses of Mudtherapy.
- M.A Yoga301.4** understand the meaning and classification of diet and fasting, difference between Starvation, hunger and appetite.

SYLLABUS

Unit-I INTRODUCTION TO NATUROPATHY

1. Meaning & Definitions, Fundamental Principles of Naturopathy.
2. Swasthya Vritam: Dinacharya, Ratricharya, Ritucharya, Vegadharana.
3. Physical, Mental, Spiritual Health.
4. Naturopathy and Allopathy.

Unit-II HYDROTHERAPY

1. Hydrotherapy: Meaning, Definition and its Benefits.
2. General Principles of Hydrotherapy.
3. Concept of Ushapan and its benefits.
4. Classification of Temperature, Effects of Different Water Temperature on the body.

Unit-III MUDTHERAPY

1. Mudtherapy: Meaning and its uses.
2. Classification of Mud for Therapeutic use and its effects.
3. Mud Bath, Different Bandages of Mud, their uses and application.
4. Soil: Meaning, Types, Characteristics and their uses in Naturopathy.

Unit-IV FASTING AND DIETETICS

1. Fasting: Meaning and Classification.
2. Difference between Fasting and Starvation, Hunger and Appetite.
3. Diet According to Naturopathy and its types.
4. Fasting: Precautions before, during and after, Effect of fasting on human Body.

References Books:-

History & Philosophy of Naturopathy – Dr. S. J. Singh

Philosophy of Nature Cure – Dr. Henri Lindlhai.

Rational Hydrotherapy: A Manual of the Physiological and Therapeutic Effects of Hydriatic

Procedures, and the Technique of their Application in the Treatment of Disease Hardcover – 9 Sep. 2004 by John Harvey Kellogg (Author), Publisher: TEACH Services, Inc. (9 September 2004), ISBN-13: 978-1572582095

Mud Therapy: Healing Through One of the Five Elements Paperback – 13 Sep 2013 by

Ashish Indani (Author), Publisher: B Jain Publishers Pvt. Ltd. (13 September 2013), ISBN-

13:978-8131908457. Rational Fasting (Ehret's Health Literature) Mass Market Paperback – Import, Jun 1971 by Arnold Ehret (Author), Publisher: Benedict Lust Publications (1 June 1971), ISBN-13:978.

PAPER – 301: Fundamentals of Naturopathy**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga301.1	3	3	3	3	3	3	3	3	3
M.A Yoga 301.2	3	3	3	3	3	3	3	3	3
M.A Yoga 301.3	3	3	3	3	3	3	3	3	3
M.A Yoga 301.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 301.1	3	3	3	3	3
M.A Yoga 301.2	3	3	3	3	3
M.A Yoga 301.3	3	3	3	3	3
M.A Yoga 301.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 301.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 301.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 301.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 301.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 302: Basic Yoga Text Principles,Upanishads and Bhagwadgita

Time: 3 Hours

Total Marks: 100 (Theory Marks: 80 + Internal Assessment: 20)

Credits=4

Note: Paper setter is required to set 2 questions from each Unit - I, II, III and IV. Unit - V consists of 10 questions of short answers distributed from all over the syllabus. The candidates are required to attempt one question from each Unit – I, II, III & IV carrying 15 marks for each question. Unit - V is compulsory for all consisting 2 marks of each short answer.

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- | | |
|----------------------|--|
| M.A Yoga302.1 | enhance the knowledge of different Upanishads, Prashan Upanishads, Mundaka Upanishads and greatness of Barma Vidhya. |
| M.A Yoga302.2 | enhance concept of Vidhya and Avidhya, Brahman, inwelling powers, realization of the truth and Sates of consciousness. |
| M.A Yoga302.3 | enhance knowledge about introduction, history, importance in modern time and nature of Dharma of Bhagwadgita. |
| M.A Yoga302.4 | understand the concept of Sankha, Gyan yoga, Karma and Bhakti Yoga with characteristics of yogi. |

SYLLABUS

Unit-I INTRODUCTION OF UPANISHADS

1. Katha Upanishad: Definition of Yoga; Nature of soul; Importance of Self Realization.
2. Prashna Upanishad: Concept of Prana and rayi (creation); Panchapranas; The five main questions.
3. Mundaka Upanikshad: Two approaches to Brahma Vidya-the Para and Apra:
4. The greatness of Brahavidya, The worthlessness of Selfish-Karma; Tapas and Gurubhakti.
5. The origin of creation, Brahman the target of meditation.

Unit-II MESSAGES OF UPANISHADS

1. Ishavasyopanishad: Concept of Karmanishta; Concept of Vidya and Avidya; Knowledge of Brahman; Atma Bhava.
2. Kena Upanishad: indwelling Power; Indriya and antahkarana; Self and the Mind;.
3. Kena Upanishad: Intutive relalization of the truth, Truth transcendental; Moral of Yaksha Upakhyana;
4. Mandukya: Four States of Consciousness and its relation to syllables in Omkara.

Unit-III BHAGWAT GITA

1. Introduction to BhagwadGita.
2. History of BhagwadGita.
3. Purpose and Importance of Yoga in Modern Time.
4. Nature of Dharma (Dharma Ka Swaroop): 2.31, 2.33, 2.39, 2.40, 3.35, 4.30, 9.31, 18.47 and 18.66

Unit-IV TYPES OF YOGA IN BHAGWADGITA

1. Sankhya and Gyan Yoga (Chapter-2: Shloka 12-72) and (Chapter-13: Shloka 07-34).
2. Karma Yoga (Chapter-3: Shloka 09-35) and (Chapter-4: Shloka 17-42).
3. Bhakti Yoga (Chapter-12: Shloka 01-20).
4. Characteristics of a Yogi (Chapter-2: Shloka 55-72).

References Books:-

Message of Upanishad, Bharatiya Vidya Bhawan, (1993)
Prasad, Ramanuj, (2003), "Know the Upanishads", V & S Publication, New Delhi, ISBN-9381384754.
Gambhirananda, Swami, (1957), Eight Upanishads with the commentary of Shankaracharya- Vol. 1 and Vol. 2", Advaita Ashrama, University of Virginia.
Radhakrishnan, Sarvepalli, (1974), "The Principal Upanishads", Allen & Unwin Publications, ISBN-8172231245.
Ghosh Aurobindo, (1995), "Essays on Gita", Shri Aurobindo Ashrama Press, Pondicherry. Ranganathananda Swami, (2000), "Universal Message of Bhagawad Gita" Vol- 1 & 2, Advaita Ashrama, ISBN-8175052139.
Shastri, A. Mahadeva, (1901), "Shrimad Bhagawad Gita with Shankara Bhashya", Literary Licensing LLC, ISBN-1498160336.
Easwaran, Eknath, "Bhagawad Gita", Nilgiri Press, Canada, ISBN-978-1-58638-019-9

PAPER – 302: Basic Yoga Text Principles,Upanishads and Bhagwadgita**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga302.1	3	3	3	3	3	3	3	3	3
M.A Yoga 302.2	3	3	3	3	3	3	3	3	3
M.A Yoga 302.3	3	3	3	3	3	3	3	3	3
M.A Yoga 302.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga302.1	3	3	3	3	3
M.A Yoga 302.2	3	3	3	3	3
M.A Yoga 302.3	3	3	3	3	3
M.A Yoga 302.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga302.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 302.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 302.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 302.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 303: APPLICATIONS OF YOGA

Time: 3 Hours

Total Marks: 100 (Theory Marks: 80 + Internal Assessment: 20)

Credits=4

Note: Paper setter is required to set 2 questions from each Unit - I, II, III and IV. Unit - V consists of 10 questions of short answers distributed from all over the syllabus. The candidates are required to attempt one question from each Unit – I, II, III & IV carrying 15 marks for each question. Unit - V is compulsory for all consisting 2 marks of each short answer.

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- | | |
|-----------------------|---|
| M.A Yoga 303.1 | enhance knowledge about meaning, aim and objective of yoga education, and its relationship with yoga and education, its factors and significance, Guru Shishya Parmpara and role of yoga in development of Human society. |
| M.A Yoga 303.2 | understand the meaning, types and development of values, value oriented education, yoga teacher and salient features of ideal yoga teacher. |
| M.A Yoga 303.3 | enhance the knowledge of Astang yoga and personality development, different yoga modules, concept of intelligence according to yoga. |
| M.A Yoga 303.4 | gain information about concept of stress, stress management techniques through yogic practices. |

SYLLABUS

Unit-I YOGA IN EDUCATION

1. Meaning, Definitions, Aim and Objectives of Yoga Education.
2. Relationship between Yoga and Education.
3. Factors of Yoga Education and its significance.
4. Guru-Shishya Prampara in Yoga Education.
5. Role of Yoga in Development of Human Society.

Unit-II VALUE EDUCATION

1. Meaning, Definitions and Types of Values.
2. Value Oriented Education and Modes of Living.
3. Contribution of Yoga towards development of values.
4. Role of Yoga Teacher in Value Oriented Education.
5. Salient Features of Ideal Yoga Teachers.

Unit-III PERSONALTY DEVELOPMENT

1. Astang Yoga and Personality Development.
2. Personality Development with Specific Emphasis on Panchkosh.
3. Different Yoga Modules to improve memories.
4. Intelligence: Meaning and Concept of Intelligence According to Yoga.
5. Yoga Practice for I.Q. development.

Unit-IV YOGA FOR STRESS MANAGEMENT

1. Stress: Introduction, Concept & Solution through Mandukya Krika (Relaxation and Stimulation) as core for stress management.
2. Techniques of Stress Management in Astang Yoga of Patanjali and Bhagwat Gita.
3. Specific Practices for Stress Management (Breath Awareness, Shavasan, Yognidra).
4. Pranayam and Meditation for Stress Management.
5. 4Impact of Yogic Life Style on Stress Management.

References Books:-

Arun Kumar Singh, Education Psychology (2015) Bharti Bhawan Publishers & Distributors.
Baron, R.A (2007). Psychology (Fifth edition) New Delhi: Pearson Prentice-Hall of India.
Baron, A. Rober, (2002) "Psychology", Pearson Education Vth Ed.
Yog Prichya and Prampira – Dr. Praveen Kumar & Dr. Amrita Pritam.
Ahuja, R (2000) Value oriented education in India. In Modi, R. (Ed.), Human values and social change, Jaipur: Rawat Publications.

PAPER – 303: APPLICATIONS OF YOGA**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 303.1	3	3	3	3	3	3	3	3	3
M.A Yoga 303.2	3	3	3	3	3	3	3	3	3
M.A Yoga 303.3	3	3	3	3	3	3	3	3	3
M.A Yoga 303.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga303.1	3	3	3	3	3
M.A Yoga 303.2	3	3	3	3	3
M.A Yoga 303.3	3	3	3	3	3
M.A Yoga 303.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 303.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 303.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 303.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 303.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 304: APPLIED PSYCHOLOGY IN YOGA

Time: 3 Hours

Total Marks: 100 (Theory Marks: 80 + Internal Assessment: 20)

Credits=4

Note: Paper setter is required to set 2 questions from each Unit - I, II, III and IV. Unit - V consists of 10 questions of short answers distributed from all over the syllabus. The candidates are required to attempt one question from each Unit – I, II, III & IV carrying 15 marks for each question. Unit - V is compulsory for all consisting 2 marks of each short answer.

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- | | |
|----------------------|---|
| M.A Yoga304.1 | understand the meaning, scope, nature, branches and methods of psychology with relevance and contribution in teaching learning process of yoga education. |
| M.A Yoga304.2 | enhance the knowledge of laws of learning, learning curves, theories of learning, motivation and motivational theories. |
| M.A Yoga304.3 | understand the meaning definition, structure and theories of personality. |
| M.A Yoga304.4 | understand the meaning, principles, importance and process of Guidance and Counseling in yoga education. |

SYLLABUS

Unit-I INTRODUCTION OF PSYCHOLOGY

1. Psychology: Meaning, Definition and Scope of Psychology in Yoga.
2. Nature and Branches of Psychology.
3. Relevance and Contribution of Psychology in Teaching & Learning Process of Yoga Education.
4. Methods of Psychology: General Introduction, Survey and Experiment Method.

Unit-II LEARNING AND MOTIVATION

1. Learning: Meaning, Definition, Laws of Learning and Learning Curves.
2. Theories of Learning: Thorndike's Trial and Error, Pavlov's Learning by conditioning.
3. Motivation: Meaning, Definition, Concept and Dynamics of Motivation in Yoga.
4. Theories of Motivation: Abraham Maslow's Self Actualization Theory, Sigmund Freud's Instinct Theory.

Unit-III PERSONALITY

1. Personality: Meaning, Definition and Structure of Personality.
2. Theories of Personality: Sigmund Freud's Psycho-Analytical Theory.
3. Type Theories of Personality: Kretschmer's, Sheldons and Jung's Classification.
4. Trait Theory of Personality: Allport and Eysenck.

Unit-IV GUIDANCE AND COUNSELLING

1. Guidance: Meaning, Definition and Significance of guidance.
2. Principles of Guidance in Yoga Education.
3. Counseling: Meaning, Definition and Significance of Counseling and Different types of Counseling.
4. Concept of Counseling Process and Qualities of a Counselor.

References Books:-

- Dr. Arun Kumar Singh, Education Psychology (2015) Bharti Bhawan Publishers & Distributors.*
- Dr. Dridge & Hung: Psychological Foundations of Education. Harper and Row Publishers.*
- Kamlesh, M. L. Education Sports Psychology, New Delhi, Friends Pub., 2006.*
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- Baron, R. A. (2007). Psychology (Fifth edition) New Delhi: Pearson Prentice-Hall of India.*
- Baron, A. Rober, (2002) "Psychology", Pearson Education Vth Ed.*
- Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler (1993), "Introduction to Psychology" – 7th Edition. Tata Mcgraw Hill Book Co. New Delhi.*

PAPER – 304: APPLIED PSYCHOLOGY IN YOGA**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga304.1	3	3	3	3	3	3	3	3	3
M.A Yoga 304.2	3	3	3	3	3	3	3	3	3
M.A Yoga 304.3	3	3	3	3	3	3	3	3	3
M.A Yoga 304.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 304.1	3	3	3	3	3
M.A Yoga 304.2	3	3	3	3	3
M.A Yoga 304.3	3	3	3	3	3
M.A Yoga 304.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 304.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 304.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 304.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 304.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 305 PRACTICAL SYLLABUS (Part i & ii)

Credits=5

Maximum Marks: 100

Part i:70 marks

Part ii:30 marks

Course Outcomes:-

After completing the course contents, students will be able to:

- M.A Yoga305.1** apply and demonstrate of Surya Namaskar , Asanas, Pranayamas and Shudhikriyas.
- M.A Yoga305.2** apply and demonstrate techniques of different yogic activities and their effects on human body.
- M.A Yoga305.3** fill psychological questionnaire in research process.
- M.A Yoga305.4** apply and demonstrate administrations of Psychological Scales for research process.

SYLLABUS

(i) Demonstrations of Asana, Pranayam and Shudhi Kriya

1. PRAYER: Gayatri Mantra, Mahamritunjya Mantra.
2. SUKSHAMA VYAYAMA
3. SURYA NAMASKAR: 12 Counts.
4. SUPINE LYING ASANAS: Sarvangasana, Padamsarvangasana, Karnpeedasana, Setubandhasana,
5. PRONE LYING ASANAS: Sarpasana, Dhanurasana, Puranabhujangasana, Puranashalabhasana.
6. SITTING ASANAS: Shirsasana, Kukkutasana, Suptvajrasana, Purnamatsyasana, Bakasana, Paschimottansana, Baddhpadmasana.
7. STANDING ASANAS: Tadasana, Vrikshasan, Trikonasana, Natrajasana.
8. PRANAYAM: Anulomvilom Pranayam, Shitali Pranayam, Ujjayi Pranayam, Suryabhedan Pranayam
9. BANDH: Mahabandh
10. MUDRA: Matangini Mudra, Shaktichalani Mudra.
11. SHATKARM:
 - a) NETI : Double Rubber Neti
 - b) DHAUTI : Vastra Dhauti, Dhanda Dhauti
 - c) KAPALBHATI : Vaatkarma, Sheetkarma
 - d) NAULI : Madhya, Vaam, Dakshine
12. MEDITATION – Om recitation
13. RELAXATION TECHNIQUES – Shavasana, Yog Nidra,
14. PRACTICAL NOTE BOOK

(ii) APPLIED PSYCHOLOGY:

- | | |
|---|--------------|
| i) Self Concept Questionnaire by Dr. Raj Kumar Saraswat. | (Marks = 10) |
| ii) Locus of Control by Levenson Scale | (Marks = 10) |
| iii) Emotional Intelligence Inventory by Dr. S. K. Mangal and
Mrs. Shubhra Mangal. | (Marks = 10) |

PAPER – 305 PRACTICAL SYLLABUSES (PART i & ii)**(i) Demonstrations of Asana, Pranayam and Shudhi Kriya****CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga305.1	3	3	3	3	3	3	3	3	3
M.A Yoga 305.2	3	3	3	3	3	3	3	3	3
M.A Yoga 305.3	3	3	3	3	3	3	3	3	3
M.A Yoga 305.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga305.1	3	3	3	3	3
M.A Yoga 305.2	3	3	3	3	3
M.A Yoga 305.3	3	3	3	3	3
M.A Yoga 305.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga305.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 305.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 305.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 305.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Open Elective

PAPER - 306 YOGA AND HEALTH

Time: Two Hours

Total Marks: 50 (Theory Marks: 40 + Internal Assessment: 10)

Note: Paper setter is required to set 2 questions from each Unit – I and II. Unit - III consists of 4 questions of short answers distributed from all over the syllabus. The candidates are required to attempt one question from each Unit – I and II carrying 16 marks for each question. Unit - III is compulsory for all consisting 2 marks of each short answer.

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- M.A Yoga306.1** enhance the concept of health, yogic diet, Asana and Pranayama in process of health promotions.
- M.A Yoga306.2** apply and demonstrate different yogic practices in treatment of different health problems i.e. Stress, Hypertension, Diabetes, Cervical Spondylosis and Obesity.

SYLLABUS

Unit – I INTRODUCTION OF HEALTH & YOGIC PRACTICES.

1. Meaning, Definition and Concept of Health
2. Yogic diet and health.
3. Cultural asanas and health: Paschimottan ,Hal ,Bujang, Shalabh, Vipritkarni, Sarvang, Trikon, Shirsh, Ushtra, Suptavajra.
4. Relaxative asanas and health: Savasna & Makrasna.
5. Meditative asanas and health: Padam, Vajra, Sihasna, Singhasna.
6. Pranayama and health: Suryabhedan,Ujjai, Sheetal, Sheetkari, Bhramari & Bhastrika.

Unit – II HEALTH PROBLEMS & TREATMENT THROUGH YOGA.

1. Shudhikriyas and health : Neti, Dhوتي, Basti, Neoli, Tratak & Kapalbhati.
2. Stress management through Yogic practises
3. Hypertension: Meaning, causes and yogic treatment.
4. Diabetes: Meaning,types, causes and yogic treatment
5. Cervical Spondylosis: Meaning, causes and yogic treatment.
6. Obesity: Meaning, causes and yogic treatment

References Books:-

- George Feuerstein, (1975). Text Book of Yoga. London: Motilal Bansaridass Publishers (P) Ltd.*
- Gore, (1990), Anatomy and Physiology of Yogic Practices. Lonavata: Kanchan Prakashan. Helen Purperhart (2004), The Yoga Adventure for Children. Netherlands: A Hunter House book.*
- Iyengar, B.K.S. (2000), Light on Yoga. New Delhi: Harper Collins Publishers.*
- Karbelkar N.V.(1993) Patanjali Yogasutra Bhashya (Marathi Edition) Amravati: Hanuman Vyayam Prasarak Mandal*
- Kenghe. C.T. (1976). Yoga as Depth-Psychology and para-Psychology (Vol-I): Historical Background, Varanasi: Bharata Manishai.*
- Kuvalyananda Swami & S.L. Vinekar, (1963), Yogic Therapy – Basic Principles and Methods. New Delhi: Govt. of India, Central Health Education and Bureau.*
- Moorthy A.M. & Alagesan. S. (2004) Yoga Therapy. Coimbatore: Teachers Publication House.*
- Swami Kuvalayanda, (1998), Asanas. Lonavala: Kaivalyadhama.*
- Swami Satyananda Sarasvati. (1989), Asana Pranayama Mudra Bandha. Munger: Bihar School of Yoga.*
- Swami Satyananda Saraswathi. (1984), Kundalini and Tantra, Bihar: Yoga Publications Trust.*

Open Elective**PAPER - 306 YOGA AND HEALTH****CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga306.1	3	3	3	3	3	3	3	3	3
M.A Yoga 306.2	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga306.1	3	3	3	3	3
M.A Yoga 306.2	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 306.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 306.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 401: YOGA THERAPY

Time: 3 Hours

Total Marks: 100 (Theory Marks: 80 + Internal Assessment: 20)

Credits=4

Note: Paper setter is required to set 2 questions from each Unit - I, II, III and IV. Unit - V consists of 10 questions of short answers distributed from all over the syllabus. The candidates are required to attempt one question from each Unit – I, II, III & IV carrying 15 marks for each question. Unit - V is compulsory for all consisting 2 marks of each short answer.

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- | | |
|-----------------------|---|
| M.A Yoga 401.1 | understand the meaning, scope, principles, importance and limitations of yoga therapy. |
| M.A Yoga 401.2 | enhance the knowledge about diseases, their causes, classifications and treatment of different types of postural deformities through yog therapy. |
| M.A Yoga 401.3 | enhance the knowledge of hypertension, obesity, blood glucose disorders, gsrlic intestinal problem, cardio respiratory disorders, their causes, symptoms and treating life style disorders through yog therapy. |
| M.A Yoga 401.4 | understand the meaning, causes, symptoms of stress, anxiety, depression insomnia, and adjustment and their yogic treatment. |

SYLLABUS

Unit-I YOGA THERAPY: AN INTRODUCTION

1. Meaning, Definition and Importance of Yoga Therapy in modern age.
2. Concept and Scope of Yoga Therapy.
3. Principles of Yoga Therapy.
4. Limitations of Using Yoga Therapy.

Unit-II CONCEPT OF DISEASES

1. Diseases, Meaning and their causes.
2. Classifications of Diseases.
3. Postural Deformities: Meaning and their Causes.
4. Treatment of Different types of Postural Deformities through Yoga Therapy (KYPHOSIS, LORDOSIS SCIOLIOSIS, KNOCK-KNEE, FLAT-FOOT).

Unit-III YOGA THERAPY FOR LIFE STYLE DISORDERS

1. Hypertension, Obesity and Blood Glucose disorders: Causes, Symptoms and Treatment through Yogic Therapy.
2. Gastric Intestinal Problem: Indigestion, Constipation, Acidity, Causes, Symptoms and Treatment through Yogic Therapy.
3. Cardio respiratory disorders: Atherosclerosis and Bronchi Asthma: Causes Symptoms and their Treatment through Yoga Therapy.

Unit-IV YOGA THERAPY FOR PSYCHOLOGICAL PROBLEMS

1. Stress, Anxiety and Depression: Meaning, Causes, Symptoms and their Treatment through Yoga.
2. Insomnia: Meaning, Causes, Symptoms and Treatment through Yoga.
3. Adjustment Problems: Meaning, Causes, Symptoms and Treatment through Yoga.
4. Attention – Deficit, Hyperactivity Disorder: Meaning, Causes, Symptoms, Treatment through Yoga.

References Books:-

Moorthy, A.M. (2005), “Yoga Therapy”, Teacher Publishing House, Coimbatore
ISBN-9788180160240.

Swami, Shivananda Saraswati, (1957) “Yoga Therapy, Umachal Yoga Ashram, Guwahati”.

Verma, Janki Prasad, (1962), “Rogo Ki Achuke Chikitsa” Leader Press, Allahabad.

Yogeshwar, “Simple Yoga Therapy”, Yoga Center, Madras. Tiwari, O.P., (1984), “Asanas-Why and How”, Kaivalayadhama, Lonavala.

Roga & Yoga- Swami Shivanand.

PAPER – 401: YOGA THERAPY**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 401.1	3	3	3	3	3	3	3	3	3
M.A Yoga 401.2	3	3	3	3	3	3	3	3	3
M.A Yoga 401.3	3	3	3	3	3	3	3	3	3
M.A Yoga 401.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 401.1	3	3	3	3	3
M.A Yoga 401.2	3	3	3	3	3
M.A Yoga 401.3	3	3	3	3	3
M.A Yoga 401.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga401.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 401.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 401.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 401.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 402: FOOD & NUTRITION (i)

Time: 3 Hours

Total Marks: 100 (Theory Marks: 80 + Internal Assessment: 20)

Credits=4

Note: Paper setter is required to set 2 questions from each Unit - I, II, III and IV. Unit - V consists of 10 questions of short answers distributed from all over the syllabus. The candidates are required to attempt one question from each Unit – I, II, III & IV carrying 15 marks for each question. Unit - V is compulsory for all consisting 2 marks of each short answer.

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- | | |
|-------------------------|--|
| M.A Yoga402(i).1 | understand the meaning, functions, classifications, principles and importance of food and nutrition. |
| M.A Yoga402(i).2 | enhance the knowledge of classification, sources, functions and requirements of various nutrients i.e. protein, fat, vitamins, minerals and water. |
| M.A Yoga402(i).3 | enhance the knowledge of balance diet, yogic diet, their factors affecting, advantages and disadvantages of vegetarian and non-vegetarian diet. |
| M.A Yoga402(i).4 | understand and apply the concept of meal planning, its affecting factors, meal planning for male and female and food intake. |

SYLLABUS

Unit-I FOOD & NUTRITION

1. Meaning of Food, Nutrition and their importance.
2. Functions of Food and Nutrition.
3. Classifications of Nutrients.
4. Basic Principles of Nutrition.

Unit-II NUTRIENTS

1. Proteins: Meaning, Classification, Sources, Functions and their requirements.
2. Fats and Carbohydrates: Meaning, Classification, Sources, Functions and their requirements.
3. Vitamins: Classification, Sources, Functions and their requirements.
4. Minerals: Classification, Sources, Functions and their requirements.
5. Water: Meaning, Sources and Functions.

Unit-III BALANCED DIET

1. Meaning and Importance of Balanced Diet.
2. Factors Affecting Balanced Diet.
3. Concept of Yogic Diet.
4. Advantages/Disadvantages of Vegetarian and Non-Vegetarian Diets.
5. Malnutrition: Meaning, Causes and Methods for overcoming Malnutrition.

Unit-IV MEAL PLANNING

1. Concept and Principles of Meal Planning.
2. Factors Affecting Meal Planning.
3. Meal Planning for Healthy Living.
4. Meal Planning for Adolescents Male and Female.
5. Food Intake: Timing, Concept of Dugdahar, Falahar, Alpahar and Apakahar in Yoga.

References Books:-

- Bessesen, D. H. (2008). *Update on obesity. J ClinEndocrinolMetab.* 93(6), 2027-2034.
- Butryn, M.L., Phelan, S., & Hill, J. O. (2007). *Consistent self-monitoring of weight: a key component of successful weight loss maintenance. Obesity (Silver Spring).* 15(12), 3091-3096.
- Chu, S.Y. & Kim, L. J. (2007). *Maternal obesity and risk of stillbirth: a metaanalysis. Am J ObstetGynecol,* 197(3), 223-228.
- DeMaria, E. J. (2007). *Bariatric surgery for morbid obesity. N Engl J Med,* 356(21), 2176-2183.
- Dixon, J.B., O'Brien, P.E., Playfair, J. (n.d.). *Adjustable gastric banding and conventional therapy for type 2 diabetes: a randomized controlled trial. JAMA.* 299(3), 316-323.

PAPER – 402: (Option-i) FOOD & NUTRITION**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga402(i).1	3	3	3	3	3	3	3	3	3
M.A Yoga 402(i).2	3	3	3	3	3	3	3	3	3
M.A Yoga 402(i).3	3	3	3	3	3	3	3	3	3
M.A Yoga 402(i).4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga402(i).1	3	3	3	2	2
M.A Yoga 402(i).2	3	3	3	2	2
M.A Yoga 402(i).3	3	3	3	2	2
M.A Yoga 402(i).4	3	3	3	2	2
Average	3	3	3	2	2

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 402(i).1	3	3	3	3	3	3	3	3	3	3	3	3	2	2
M.A Yoga 402(i).2	3	3	3	3	3	3	3	3	3	3	3	3	2	2
M.A Yoga 402(i).3	3	3	3	3	3	3	3	3	3	3	3	3	2	2
M.A Yoga 402(i).4	3	3	3	3	3	3	3	3	3	3	3	3	2	2
Average	3	3	3	3	3	3	3	3	3	3	3	3	2	2

M.A Yoga 402: Option – (ii) - Dissertation

Maximum Marks: 100
(Evaluation Marks =80+ Int. Assessment = 20)

Note: Students must submit their Dissertation in the office of the Department before the Start of 4th semester theory exams.

Course Outcomes:-

After completing the course contents of this course, the students will be able to: -

- | | |
|---------------------------|--|
| M.A Yoga 402(ii).1 | enhance the basic concept of research and its need and characteristics in Physical Education and Sports. |
| M.A Yoga 402(ii).2 | enhance the knowledge about research process and its contents. |
| M.A Yoga 402(ii).3 | apply review of related literature. |
| M.A Yoga 402(ii).4 | apply statistical techniques for computing results and writing research reports. |

M.A Yoga – 402: Option – (ii) - Dissertation**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 402(ii).1	3	2	3	3	3	3	1	1	3
M.A Yoga 402(ii).2	3	2	3	3	3	3	2	3	3
M.A Yoga 402(ii).3	3	3	3	3	3	3	1	3	3
M.A Yoga 402(ii).4	3	3	3	3	3	3	3	3	3
Average	3	2.5	3	3	3	3	1.75	2.50	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 402(ii).1	3	2	3	3	3
M.A Yoga 402(ii).2	3	2	3	3	3
M.A Yoga 402(ii).3	3	2	3	3	3
M.A Yoga 402(ii).4	3	2	3	3	3
Average	3	2	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 402(ii).1	3	2	3	3	3	3	1	1	3	3	2	3	3	3
M.A Yoga 402(ii).2	3	2	3	3	3	3	2	3	3	3	2	3	3	3
M.A Yoga 402(ii).3	3	3	3	3	3	3	1	3	3	3	2	3	3	3
M.A Yoga 402(ii).4	3	3	3	3	3	3	3	3	3	3	2	3	3	3
Average	3	2.5	3	3	3	3	1.75	2.50	3	3	2	3	3	3

PAPER – 403: KINESIOLOGICAL ASPECT OF YOGA

Time: 3 Hours

Total Marks: 100 (Theory Marks: 80 + Internal Assessment: 20)

Credits=4

Note: Paper setter is required to set 2 questions from each Unit - I, II, III and IV. Unit - V consists of 10 questions of short answers distributed from all over the syllabus. The candidates are required to attempt one question from each Unit – I, II, III & IV carrying 15 marks for each question. Unit - V is compulsory for all consisting 2 marks of each short answer.

Course Outcomes:-

After completing the course contents of this course, the students will be able to: -

- | | |
|----------------------|--|
| M.A Yoga403.1 | enhance the knowledge of Kinesiology its scope, axis and planes, their types, terminology of body position and body movements. |
| M.A Yoga403.2 | understand the meaning, functional classification, origin, insertion and action of various groups of muscles. |
| M.A Yoga403.3 | enhance the knowledge of origin, insertion and action of shoulder joint and elbow joint. |
| M.A Yoga403.4 | enhance the knowledge of movement, origin, insertion and action of hip and knee joint. |

SYLLABUS

Unit-I INTRODUCTION OF KINESIOLOGY AND BODY MOVEMENTS

1. Kinesiology: Meaning, significance and scope in Yoga.
2. Medical Terminology of Body Position.
3. Axis and planes: meaning and Types.
4. Terminologies of different Body movements.
5. Skeletal Muscle: Gross Structure, meaning of muscle origin and Insertion.

Unit-II MUSCLES OF VARIOUS REGIONS

1. Functional classification Skeletal Muscles.
2. Origin, Insertion and Actions of Muscles in different asanas: Latissimus Dorsi, Trapezius
3. Rhomboid Major, Rhomboid Minor, Rectus Abdominal, Gluteus Maximus,
4. Gluteus Medius, Gluteus Minimus and Sternocleidomastoid muscle.

Unit-III JOINTS OF UPPER EXTREMITY

1. Shoulder Joint – Structure, Ligaments, Muscle Reinforcement and Movements.
2. Elbow Joint – Structure, Ligaments, Muscle Reinforcement and Movements. Origin, Insertion and Actions of Muscles in different asanas: Deltoid, Biceps, Triceps and Pectoralis Major.

Unit-IV JOINTS OF LOWER EXTREMITY

1. Hip Joint – Structure, Ligaments, Muscle reinforcement and Movements.
2. Knee Joint - Structure, Ligaments, Muscle reinforcement and Movements.
3. Origin, Insertion and Action of Muscles in different asanas: Hamstrings group of Muscles, Quadriceps group of Muscles, Sartorius Muscle, Gastrocnemius Muscle.

References Books:-

- Gowitzke, B.A and Milner, M (1988). *Scientific Basis of Human Movement* (3rd. ed.) Baltimore: Williams and Wilkins.
- Groves, R and Camaine, D. (1983). *Concepts in Kinesiology*. (2nd.ed) Philadelphia: Saunders College Publishing.
- Hay, J. & Reid, J (1982). *The Anatomical and Mechanical Basis of Human Motion*. Englewood Cliffs: Prentice – Hall
- Luttegens, Kathryn, Deutsch, Helga, Hamilton, Nancy. *Kinesiology- Scientific Basis of Human Motion*. 8th. Ed., Brown & Bench mark.
- Rasch, P. (1989) *Kinesiology and Applied Anatomy*. Philadelphia: Lea & Febiger.
- Thompson, C. (1985). *Manual of Structural Kinesiology*. (10th. ed.) St. Louis: Times Mirror/ Mosby College Publishing.

PAPER – 403: KINESIOLOGICAL ASPECT OF YOGA**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga403.1	3	3	3	3	3	3	3	3	3
M.A Yoga 403.2	3	3	3	3	3	3	3	3	3
M.A Yoga 403.3	3	3	3	3	3	3	3	3	3
M.A Yoga 403.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 403.1	3	3	3	3	3
M.A Yoga 403.2	3	3	3	3	3
M.A Yoga 403.3	3	3	3	3	3
M.A Yoga 403.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga403.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 403.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 403.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 403.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER- (404): TEACHING METHODS OF YOGA

Time: 3 Hours

Total Marks: 100 (Theory Marks: 80 + Internal Assessment: 20)

Credits=4

Note: Paper setter is required to set 2 questions from each Unit - I, II, III and IV. Unit - V consists of 10 questions of short answers distributed from all over the syllabus. The candidates are required to attempt one question from each Unit – I, II, III & IV carrying 15 marks for each question. Unit - V is compulsory for all consisting 2 marks of each short answer.

Course Outcomes:-

After completion of the course contents of this paper, the student will be able to:

- M.A Yoga404.1** enhance and apply the knowledge of teaching methods , meaning, importance, types, principles and modern concept in teaching learning process.
- M.A Yoga404.2** apply and demonstrate, command, class formation, teaching aids, its types, importance and modern concept of teaching aids.
- M.A Yoga404.3** apply the principles of lesson plan alongwith its objective and effecting factor in teaching yoga.
- M.A Yoga404.4** understand the meaning, steps, factors affecting and importance of class management with enhance the knowledge of organization and rules of yoga competitions.

SYLLABUS

UNIT –I TEACHING METHODS

1. Meaning, Definition and Importance of Teaching Methods in Yoga.
2. Modern Concept of Teaching Methods Types of Teaching Methods in Yoga.
3. Factors Affecting Teaching Methods.
4. Principles of teaching.

UNIT-II COMMAND, FORMATION AND TEACHING AIDS

1. Command: Their types and uses in Yoga.
2. Teaching Aids: Meaning and Importance.
3. Types of Teaching Aids
4. Modern concept of teaching Aids.
5. Class Formation: Meaning, Types and their importance.

UNIT-III LESSON PLANNING

1. Meaning and Importance of Lesson Plan.
2. Objectives and Steps of Making Lesson Plan.
3. Types of Lesson Plan.
4. Factors Affecting Lesson Plan.
5. Basic Principles of Making Lesson Plan

UNIT-IV CLASS MANAGEMENT

1. Meaning and Importance of Class Management.
2. Factors Affecting Class Management.
3. Steps of Class Management.
4. Organization and administration of Yoga Competition.
5. Rules of Inter-collegiate/University Level Yoga Competition.

References Books:-

Bhatia and Bhatia Doaba House, (1959) The Principles and Methods of Teaching New Delhi.
Prof. Ramesh Chandra (2004), Technology in the preparation of Teachers”, Usha Books, Delhi.
Kochar S.K, (2010) “Methods and Techniques of Teaching ,Sterling Publishers, New Delhi
Walia JS, (2003) “Principles and Methods of Education” Plant Publishers Jalandhar City-.

PAPER- (404): TEACHING METHODS OF YOGA**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga404.1	3	3	3	3	3	3	3	3	3
M.A Yoga 404.2	3	3	3	3	3	3	3	3	3
M.A Yoga 404.3	3	3	3	3	3	3	3	3	3
M.A Yoga 404.4	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga404.1	3	3	3	3	3
M.A Yoga 404.2	3	3	3	3	3
M.A Yoga 404.3	3	3	3	3	3
M.A Yoga 404.4	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 404.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 404.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 404.3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 404.4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PAPER – 405 PRACTICAL SYLLABUS ((Part i &ii)

Credits=5

Maximum Marks: 100

Part i Marks: 50

Part ii Marks:50

Course Outcomes:

After completing the course contents, students will be able to:

- M.A Yoga405.1** apply and demonstrate different techniques of Prayer, Surya Namaskar and Chander Namaskar
- M.A Yoga405.2** apply and demonstrate different techniques of various Asanas, Pranayams and Sudhikriyas on human body.
- M.A Yoga405.3** make lesson planning for different yogic activities.
- M.A Yoga405.4** apply and demonstrate different yogic activities with suitable pedagogical techniques.

SYLLABUS

(i) Demonstrations of Asana, Pranayam and Shudhi Kriya

1. PRAYER: Sankalp Mantra.
2. SUKSHAMA VYAYAMA
3. SURYA NAMASKAR: 12 Counts. CHANDRA NAMASKAR.
4. PRAGYA YOGA
5. SUPINE LYING ASANAS: Vipritkarniasana, Halasana, Chakrasana, Naukasana, Pawankuktasana,
6. PRONE LYING ASANAS: Bhujangasana, Shalabhasana, Dhanurasana, Vipritnaukasana,
7. SITTING ASANAS: Vajrasana, Suptvajrasana, Padamasana, Shashankasana, Akarana Dhanurasana, Gomukhasana, Ushtrasana, Ardhamatsyandrasana, Ekpadsandhasana, Vatyanasana.
8. STANDING ASANAS: Tadasana, Vrikshasan, Trikonasana, Natrajasana.
9. PRANAYAM: Anulomvilom Pranayam, Shitali Pranayam, Ujjayi Pranayam, Suryabhedan Pranayam
10. SHATKARM:
 - a) NETI : Jal, Rubber Neti
 - b) DHAUTI : Vaman (Kunjali), Dhanda Dhauti
 - c) KAPALBHATI : Vaatkarma, Sheetkarma
 - d) TRATAK
11. MEDITATION – Om recitation
12. RELAXATION TECHNIQUES – Shavasana, Yog Nidra,
13. PRACTICAL NOTE BOOK

(ii) Teaching Practices of Asana, Pranayama and Shatkarmas:

Practice of teaching

Five lesson plans on any skill (Three Asanas, One Pranayama and One Kriya) on lesson format with chart and Viva-Voce. In the final exam model will be compulsory for all the students.

PAPER- (405): PRACTICAL SYLLABUS ((Part i &ii))**CO-PO Mapping Matrix**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga405.1	3	3	3	3	3	3	3	3	3
M.A Yoga 405.2	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3

CO-PSO Mapping Matrix

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga405.1	3	3	3	3	3
M.A Yoga 405.2	3	3	3	3	3
Average	3	3	3	3	3

CO-PO-PSO Mapping Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga405.1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 405.2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 4: CO-PO-PSO mapping matrix for all the courses of M.A. Yoga.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
M.A Yoga 101	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 102	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 103	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 104	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 105	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 201	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 202	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 203	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 204	3	3	3	3	3	3	3	3	3	1	3	3	3	3
M.A Yoga 205	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 206	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 301	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 302	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 303	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 304	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 305	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 306	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 401	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 402(i)	3	3	3	3	3	3	3	3	3	3	3	3	2	2
M.A Yoga 402(ii)	3	2.5	3	3	3	3	1.75	2.50	3	3	2	3	3	3
M.A Yoga 403	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 404	3	3	3	3	3	3	3	3	3	3	3	3	3	3
M.A Yoga 405	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Attainment of COs:

The attainment of COs can be measured on the basis of the results of internal assessment and semester examination. The attainment is measured on scale of 3 after setting the target for COs attainment. Table 5 shows the CO attainment levels assuming the set target of 50% marks:

Table 5 : CO Attainment Levels for internal assessment.

Attainment Level	
1 (Low level of attainment)	50% of students score more than 50% of marks in class tests of a course.
2 (Medium level of attainment)	60% of students score more than 50% of marks in class tests of a course.
3 (High Level of attainment)	70% of students score more than 50% of marks in class tests of a course.

Note: In the above table, the set target is assumed as 50%. It may vary in different departments/institutes. The staff Councils of the departments/institutes may finalize the set target.

A proper mapping of course outcomes with assessment methods should be defined before measuring the attainment level. The questions in tests for internal assessment are based on COs. Here it is assumed that class test – I is based on first two COs (i.e. M.A Yoga 101.1 and M.A Yoga 101.2) of a course with equal weightage given to both COs. Similarly class test – II is based on next two COs (i.e. M.A Yoga 101.3 and M.A Yoga 101.4) of a course with equal weightage given to these two COs. For each internal assessment test, the percentage of students attaining the target level of CO is estimated and average percentage will decide the attainment level of COs. Following steps may be followed for determining the attainment level in internal assessment of course.

- Estimate the %age of students scoring set target (say 50%) or more in the questions of test-I based on first CO i.e. M.A Yoga 101.1
- Estimate the %age of students scoring set target (50%) or more in the question(s) of test-I based on second CO i.e. M.A Yoga 101.2
- Estimate the %age of students scoring set target (50%) or more in the question(s) of test-II based on third CO i.e. M.A Yoga 101.3
- Estimate the %age of students scoring set target (50%) or more in the question(s) of test-II based on fourth CO i.e. M.A Yoga 101.4
- Take average of the percentages obtained above.
- Determine the attainment level i.e. 3, 2 or 1 as per scale defined in table 5.

Note: In the above steps, it is assumed that internal assessment is based on two tests only. However if internal assessment is based on more than two tests and/or on assignment then same may be incorporated to determine the CO attainment level. There may be more than four Cos for a course. The set target may also be different for different COs. These issues may resolved by the Staff Councils of the departments/institutes.

For determining the attainment levels for end semester examination, it is assumed that questions in the end term examination are based on all COs of the course. Attainment levels for end semester examination of a course can be determined after the declaration of the results. The CO attainment levels for end semester examination are given in Table 6.

Table 6 : CO Attainment Levels for End Semester Examination (ESE)

Attainment Level	
1 (Low level of attainment)	60% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
2 (Medium level of attainment)	70% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
3 (High Level of attainment)	80% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.

Note: In the above table, the set target is assumed as grade A for CBCS courses and 60% for non-CBCS courses. It may vary in different departments/institutes. The staff Councils of the departments/institutes may finalize the set target.

Overall CO Attainment level of a Course:

The overall CO attainment level of a course can be obtained as:

Overall CO attainment level = 50% of CO attainment level in Internal assessment + 50% of CO Attainment level in end semester examination.

The overall COs attainment level can be obtained for all the courses of the program in a similar manner.

Attainment of POs:

The overall attainment level of POs is based on the values obtained using direct and indirect methods in the ratio of 80:20. The direct attainment of Pos is obtained through the attainment of COs. The overall CO attainment value as estimated above and CO-PO mapping value as shown in Table 4 are used to compute the attainment of POs. PO attainment values obtained using direct method can be written as shown in the Table 7.

Table 7: PO Attainment Values using Direct Method

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
M.A Yoga 101									

M.A Yoga 102									
M.A Yoga 103									
-									
M.A Yoga 405									
Direct PO attainment	Average of above values	Average of above values	Average of above values	--	--	--	--	--	Average of above values

The PO attainment values to be filled in above table can be obtained as follows:

For M.A Yoga 101-PO1 Cell:

PO1 attainment value = (Mapping factor of M.A Yoga 101-PO1 from Table 4 x Overall CO attainment value for the course M.A Yoga 101)/3

For M.A Yoga 104-PO1 Cell:

PO1 attainment value = (Mapping factor of M.A Yoga 104-PO1 from Table 4 x Overall CO attainment value for the course M.A Yoga 104)/3

Similarly values for each cell of Table 7 can be obtained. The direct attainment of Pos is average of individual PO attainment values.

In order to obtain the PO attainment using indirect method, a student exit survey based on the questionnaire of Pos may be conducted at end of last semester of the program. The format for the same is given in Table 8. Average of the responses from the outgoing students for each PO is estimated.

The overall PO attainment values are obtained by adding attainment values estimated using direct and indirect methods in the proportion of 80:20 as follows:

Overall attainment value for PO1 =

[0.8 x average attainment value for PO1 using direct method (from table 7)] + [0.2 x average response of outgoing students for PO1].

Similarly overall attainment value can be obtained for each PO.

Table 8: PO Questionnaire for indirect measurement of PO attainment
(For Outgoing students)

At the end of my degree program I am able to do:

Statements of POs	Please Tick any one		
1. Learners will be able to comprehend the acquire knowledge during the Program of study.	3	2	1
2. Learners will be able to reflect on the issues relating to the discipline- 'Education'.	3	2	1
3. Learners will be able to exhibit the	3	2	1

professional skills and competencies acquired during the Program of study.			
4. Learners will be able to show scientific & research capabilities in their academic, professional and general life pursuits.	3	2	1
5. Learners will be able to apply the knowledge and skills acquired in academic planning, organizing, evaluation, decision making, resource management according to pre-determined objectives/outcomes.	3	2	1
6. Learners will be able to work as member or leader in various teams and multi-disciplinary & diverse settings.	3	2	1
7. Learners will be able to discuss and solve the problems relating to the discipline and life.	3	2	1
8. Learners will be able to state and follow the ethical issues relating to the discipline and society.	3	2	1
9. Learners will be able to apply different tools and techniques of communication and related skills.	3	2	1

Overall PO attainment values can be written as shown in Table 9:

Table 9: Overall PO attainment Values.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
Direct PO attainment									
Indirect PO attainment									
Overall PO attainment.									
Target									

The overall PO attainment values obtained above are compared with set target. The set target for each PO may be different and can be finalized by the staff councils of the departments/institutes. If overall PO attainment value is less than the set target value then an action plan may be prepared for improvement in the subsequent academic session.

The overall PSO attainment level based on CO-PSO mapping values and overall CO attainment values can be obtained in a similar manner.

KURUKSHETRA UNIVERSITY KURUKSHETRA

**SCHEME OF EXAMINATION FOR B.Sc. UNDER CHOICE BASED CREDIT SYSTEM
W.E.F. 2020-2021 IN PHASED MANNER**

**SUBJECT : CHEMISTRY
OUTCOME BASED CBCS Syllabi for B.Sc. Part-I, Part-II and Part-III**

B.Sc. Part-I (Ist Semester)

Paper No.	Paper code	Course Code	Nomenclature	Max Marks Written + I.A#.	Total marks	Credits	Hours / week	Duration of Exam. (Hrs.)
I	DSCC-108	CHEM-101	Inorganic Chemistry-I	40+10	50	2	2	3
II	DSCC-109	CHEM-102	Physical Chemistry-I	40+10	50	2	2	3
III	DSCC-110	CHEM-103	Organic Chemistry-I	40+10	50	2	2	3
IV	DSCC-111	CHEM-104	Chemistry Practical-I	40+10	50	2	4	6

B.Sc. Part-I (2nd Semester)

Paper No.	Paper code	Course Code	Nomenclature	Max Marks Written + I.A#.	Total marks	Credits	Hours/week	Duration of Exam. (Hrs.)
I	DSCC-208	CHEM-201	Inorganic Chemistry-II	40+10	50	2	2	3
II	DSCC-209	CHEM-202	Physical Chemistry-II	40+10	50	2	2	3
III	DSCC-210	CHEM-203	Organic Chemistry-II	40+10	50	2	2	3
IV	DSCC-211	CHEM-204	Chemistry Practical-II	40+10	50	2	4	6

B.Sc. Part-II (3rd Semester)

Paper No.	Paper code	Course Code	Nomenclature	Max Marks Written + I.A#.	Total marks	Credits	Hours/week	Duration of Exam. (Hrs.)
I	DSCC-308	CHEM-301	Inorganic Chemistry-III	40+10	50	2	2	3
II	DSCC-309	CHEM-302	Physical Chemistry-III	40+10	50	2	2	3
III	DSCC-310	CHEM-303	Organic Chemistry-III	40+10	50	2	2	3
IV	DSCC-311	CHEM-304	Chemistry Practical-III	40+10	50	2	4	6

B.Sc. Part-II (4th Semester)

Paper No.	Paper code	Course Code	Nomenclature	Max Marks Written + I.A#.	Total marks	Credits	Hour/week	Duration of Exam. (Hrs.)
I	DSCC-408	CHEM-401	Inorganic Chemistry-IV	40+10	50	2	2	3
II	DSCC-409	CHEM-402	Physical Chemistry-IV	40+10	50	2	2	3
III	DSCC-410	CHEM-403	Organic Chemistry-IV	40+10	50	2	2	3
IV	DSCC-411	CHEM-404	Chemistry Practical-IV	40+10	50	2	4	6

B.Sc. Part-III (5th Semester)

Paper No.	Paper code	Course Code	Nomenclature	Max Marks Written + I.A#.	Total marks	Credits	Hours /week	Duration of Exam. (Hrs.)
I	DSEC-508	CHEM-501-I	Heterocyclic and Photochemistry	40+10	50	2	2	3
		CHEM-501-II	Bio-organic Chemistry					
II	DSEC-509	CHEM-502-I	Organometallic Chemistry, Inorganic Polymers and Quantum Mechanics	40+10	50	2	2	3
		CHEM-502-II	Applied Chemistry					
III	DSEC-510	CHEM-503-I	Chemistry Practical-V	40+10	50	2	4	6
		CHEM-503-II						

B.Sc. Part-III (6th Semester)

Paper No.	Paper code	Course Code	Nomenclature	Max Marks Written + I.A#.	Total marks	Credits	Hours /week	Duration of Exam. (Hrs.)
I	DSEC-608	CHEM-601-I	Applied Physical Chemistry	40+10	50	2	2	3
		CHEM-601-II	Green Chemistry, Organosulphur Compounds and Organic Polymers					
II	DSEC-609	CHEM-602-I	Analytical Chemistry	40+10	50	2	2	3
		CHEM-602-II	Nuclear Chemistry, Organosulphur Compounds and Catalysis					
III	DSEC-610	CHEM-603-I	Chemistry Practical-VI	40+10	50	2	4	6
		CHEM-603-II						

SKILL ENHANCEMENT COURSE

Paper No.	Paper code	Course Code	Nomenclature	Max Marks Written + I.A#.	Total marks	Credits	Hour/ week	Duration of Exam. (Hrs.)
I	SEC-601 (SKILL ENHANCEMENT COURSE-IV)	SECC-I	Clinical Chemistry	40+10	50	2	2	3
		SECC-II	Chemistry Lab-maintenance and Handling	40+10	50	2	2	3

Program Outcomes (PO) for Under Graduate Programmes (CBCS) in the Faculty of Sciences, Kurukshetra University, Kurukshetra

PO1	Knowledge	Capable of demonstrating comprehensive disciplinary knowledge gained during course of study
PO2	Communication	Ability to communicate effectively on general and scientific topics with the scientific community and with society at large
PO3	Problem Solving	Capability of applying knowledge to solve scientific and other problems
PO4	Individual and Team Work	Capable to learn and work effectively as an individual , and as a member or leader in diverse teams, multidisciplinary settings
PO5	Investigation of Problems	Ability of critical thinking, analytical reasoning and research based knowledge including design of experiments, analysis and interpretation of data to provide conclusions
PO6	Modern Tool usage	Ability to use and learn techniques, skills and modern tools for scientific practices
PO7	Science and Society	Ability to apply reasoning to assess the different issues related to society and the consequent responsibilities relevant to the professional scientific practices
PO8	Life-Long Learning	Aptitude to apply knowledge and skills that are necessary for participating in learning activities throughout life
PO9	Environment and Sustainability	Ability to design and develop modern systems which are environmentally sensitive and to understand the importance of sustainable development
PO10	Ethics	Apply ethical principles and professional responsibilities in scientific practices
PO11	Project Management	Ability to demonstrate knowledge and understanding of the scientific principles and apply these to manage projects

PROGRAMME SPECIFIC OUTCOMES

PSO1 Acquire good knowledge about the fundamentals and applications of chemical and scientific theories.

PSO2 All branches of Science and Technology are related to Chemistry.

PSO3 Easily assess the properties of all elements discovered.

PSO4 Will become familiar with the different branches of chemistry like analytical, physical, organic, inorganic, environmental and polymer.

PSO5 Will help in understanding the causes of environmental pollution and can open up new methods to control environmental pollution.

PSO6 Will develop analytical skills and problem-solving skills requiring application of chemical principles.

PSO7 Have the ability to synthesize, separate and characterize compounds using laboratory and instrumentation techniques.

B. Sc. Ist Year (Ist Semester)
Paper-I (CHEM-101) Inorganic Chemistry-I (Theory)

Credit : 2
Time: 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Atomic Structure

Idea of de Broglie matter waves, Heisenberg's uncertainty principle, atomic orbitals, quantum numbers, radial and angular wave functions, normal and orthogonal wave functions, significance of Ψ and Ψ^2 , probability distribution curves, shapes of s, p, d, f orbitals, Aufbau and Pauli exclusion principles, Hund's multiplicity rules, Electronic configuration of elements, effective nuclear charge, Slater's rules.

Periodic table and atomic properties

Classification of periodic table into s, p, d, f blocks, atomic and ionic radii, ionisation energy, electron affinity and electronegativity definition, methods of determination or evaluation, trend in periodic table (in s and p-block elements), Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale, Sanderson's electron density ratio.

Section – B (15 hrs)

Covalent Bond

Valence bond theory (Heitler-London and Pauling approach) and its limitation, directional characteristics of covalent bond, various type of hybridisation and shapes of simple inorganic molecules and ions (BeF_2 , BF_3 , CH_4 , PF_5 , SF_6 , IF_7 , SO_4^{2-} , ClO_4^- , NO_3^-) valence shell electron pair repulsion (VSEPR) theory to NH_3 , H_3O^+ , SF_4 , ClF_3 , H_2O , SnCl_2 , ClO_3^- and ICl_2^- . Molecular orbital theory of homonuclear (N_2 , O_2) heteronuclear (CO and NO) diatomic molecules and ions, bond energy, bond angle, bond length and dipole moments, percentage ionic character from dipole moment and electronegativity difference.

Ionic Solids

Ionic structures (NaCl , CsCl , ZnS (Zinc blende), CaF_2) size effects, radius ratio rule and its limitations, Madelung constant, Stoichiometric and Non stoichiometric defects in crystals, Lattice energy (mathematical derivation excluded) and Born-Haber cycle, Solvation energy and its relation with solubility of Ionic solids, Polarizing power and Polarizability of ions, Fajan's rule.

Course Outcomes :

CO1: States the postulates of quantum mechanics and Schrodinger equation to explain the structure of hydrogen atom.

- CO2:** To study and explain the Radial and angular nodes and their significance in describing shapes of s,p and d orbitals.
- CO3:** Know about Spin quantum numbers and magnetic quantum numbers and their significance.
- CO4:** Have knowledge about Electronic configuration, Effective nuclear charge and Slater's rule.
- CO5:** To learn about Ionic bonding and energy consideration in ionic bonding to Explain Lattice energy and solvation energy.
- CO6:** To study Born-Landé equation and Born-Haber cycle, polarizing power and polarizability.
- CO7:** To apply VSEPR theory in explaining shapes of some inorganic molecules and ions.
- CO8:** Know about Rules of LCAO method, Bonding and antibonding molecular orbitals.

Mapping of CO with PO's and PSO's

Paper No. CHEM-101

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13	PO 14	PO 15	PO 16	PO 17	PO 18
CO1	S	S	S	S	S	M	M	S	S	S	S	S	S	S	S	M	S	S
CO2	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	M	S	S
CO3	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO5	S	S	S	S	S	S	M	S	M	S	S	S	S	S	S	M	S	S
CO6	S	S	S	S	S	S	S	S	M	M	S	S	S	S	S	M	S	S
CO7	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO8	S	S	S	S	S	M	M	S	S	S	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Lee, J.D. *Concise Inorganic Chemistry* ELBS, 1991.
- Cotton, F.A., Wilkinson, G. & Gaus, P.L. *Basic Inorganic Chemistry*, 3rd ed., Wiley.
- Douglas, B.E., McDaniel, D.H. & Alexander, J.J. *Concepts and Models in Inorganic Chemistry*, John Wiley & Sons.
- Huheey, J.E., Keiter, E.A., Keiter, R.L. & Medhi, O.K. *Inorganic Chemistry: Principles of Structure and Reactivity*, Pearson Education India, 2006.
- Pradeep's inorganic chemistry, Volume I.
- R Chand, inorganic chemistry, Volume I.
- Modern publications, inorganic chemistry, Volume I.

B. Sc. Ist Year (Ist Semester)
Paper-II (CHEM-102) Physical Chemistry-I (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Kinetic Theory of Gases

Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation, Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation, Van der Waals equation of state for real gases. Boyle temperature (derivation not required). Critical phenomena, critical constants and their calculation from Van der Waals equation. Andrews isotherms of CO₂. Maxwell Boltzmann distribution laws of molecular velocities and molecular energies (graphic representation – derivation not required) and their importance.

Temperature dependence of these distributions. Most probable, average and root mean square velocities (no derivation). Collision number, collision frequency, collision diameter and mean free path of molecules.

Liquids

Structure of liquids, Surface tension and its determination using a stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only).

Section – B (15 hrs)

Solids

Forms of solids. Unit cells, crystal systems, Bravais lattice types and identification of lattice planes. Laws of Crystallography - Law of constancy of interfacial angles, Law of rational indices. Miller indices. Elementary idea of symmetry and symmetry elements, X-Ray diffraction by crystals, Bragg's law. Structures of NaCl, KCl and CsCl (qualitative treatment only). Defects in crystals. Glasses and liquid crystals.

Solutions and Colligative Properties

Methods of expressing concentrations of solutions, Ideal and non-ideal solutions, Recapitulation of Raoult's law and colligative properties, Thermodynamic derivation of relation between amount of solute and elevation in boiling point and depression in freezing point. Applications in calculating molar masses of normal, dissociated and associated solutes in solution.

Course Outcomes :

- CO1:** To learn about Role of temperature and pressure to establish the state of gases and describe the Concept of critical temperature, pressure and volume of real gases
- CO2:** To understand the Maxwell distribution law and various parameters associated with collisions ideal gas molecules
- CO3:** To study the Physical properties of liquids like surface tension, viscosity and their measurements
- CO4:** To understand the morphology of crystalline solids and have knowledge about various types of symmetries present in different solids
- CO5:** To be able to describe X-rays diffraction and Bragg's law
- CO6:** To have knowledge about solutions and colligative properties and their application in determining molar mass of solute.

Mapping of CO with PO's and PSO's**Paper No. CHEM-102**

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO2	S	S	S	S	S	S	M	S	M	S	S	S	S	S	S	M	S	S
CO3	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO5	S	S	S	S	S	S	M	S	M	S	S	S	S	S	S	M	S	S
CO6	S	S	S	S	S	S	M	S	M	M	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Barrow, G.M. *Physical Chemistry* Tata McGraw-Hill (2007).
- Castellan, G.W. *Physical Chemistry* 4th Ed. Narosa (2004).
- B. R. Puri, Madan S. Pathania , L. R. Sharma *Principles of Physical Chemistry*, 48th Ed., Vishal Publications.
- Peter Atkins , Julio de Paula , James Keeler *Atkins' Physical Chemistry*, Oxford University Press.

B. Sc. Ist Year (Ist Semester)
Paper-III (CHEM-103) Organic Chemistry-I (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section-A (15 hrs)

Fundamentals of Organic Chemistry

Structure and Bonding: Localized and delocalized chemical bond, Van der Waals interactions, resonance: conditions, resonance effect and its applications, hyperconjugation, inductive effect, Electromeric effect & their comparison.

Mechanism of Organic Reactions: Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking. Types of reagents—electrophiles and nucleophiles. Types of organic reactions (Substitution, Addition, Elimination, Rearrangement etc.). Reactive intermediates: Carbocations, carbanions, free radicals, carbenes (structure & stability).

Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values.

Stereochemistry of Organic Compounds

Concept of isomerism: Types of isomerism, Optical isomerism, elements of symmetry, molecular chirality, enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers and meso compounds (tartaric acid and 2,3-dichlorobutane), threo- and erythro-diastereomers (Erythrose, Threose, 2,3-dichlorobutane), resolution of enantiomers, Relative and absolute configuration, CIP rules, R & S nomenclature. Geometric isomerism: Configuration of geometric isomers. Cis-Trans and E & Z nomenclature, Conformational isomerism: conformational analysis of ethane and n-butane; chair, boat, half chair and twist boat conformations of cyclohexane (interconversions and energy level diagram). Interconversions of Newman projection and Sawhorse formulae, Wedge Formula and Fischer representations (Erythrose, Threose and Tartaric acid), Difference between configuration and conformation.

Section-B (15 hrs)

Alkanes and Cycloalkanes

IUPAC nomenclature of branched and unbranched alkanes, classification of carbon atoms in alkanes. Isomerism in alkanes, sources, methods of formation: Wurtz reaction, Kolbe reaction,

Corey-House reaction and decarboxylation of carboxylic acids, physical properties. Mechanism of free radical halogenation of alkanes: reactivity and selectivity.

Nomenclature, Baeyer's strain theory and its limitations, theory of strainless rings.

Alkenes and Dienes:

Nomenclature of alkenes, mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halide. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes. Chemical reactions of alkenes, mechanisms involved in halogenations and halohydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration-oxidation, oxymercuration, reduction, ozonolysis, hydration, hydroxylation and oxidation with KMnO_4 .

Nomenclature and classification of dienes: isolated, conjugated and cumulated dienes. Structure of butadiene. Chemical reactions: 1,2 and 1,4 additions (Electrophilic & free radical mechanism), Diels-Alder reaction (effects of substituent excluded)

Alkynes:

Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes, acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation of alkynes.

Course Outcomes:

- CO1:** Have sound knowledge of the basic organic chemistry like electron displacement effects with suitable examples.
- CO2:** Get information about the types of structural and stereoisomers, optical isomerism, and different nomenclature like D/L, R/S cis/trans, E/Z etc. of various organic compounds.
- CO3:** Learn nomenclature of various type of alkanes and cycloalkanes, preparation and their chemical reactions.
- CO4:** Sound knowledge of alkenes, alkynes, dienes and their chemical reactions.

Mapping of CO with PO's and PSO's

Paper No. CHEM-103

Course Outcome	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO2	S	S	S	M	S	S	W	S	W	W	S	S	S	S	S	M	S	S
CO3	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO4	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Graham Solomon, T.W., Fryhle, C.B. & Snyder, S.A. *Organic Chemistry*, John Wiley & Sons (2014).

- McMurry, J.E. *Fundamentals of Organic Chemistry*, 7th Ed. Cengage Learning India Edition, 2013.
- Sykes, P. *A Guidebook to Mechanism in Organic Chemistry*, Orient Longman, New Delhi (1988).
- Eliel, E.L. *Stereochemistry of Carbon Compounds*, Tata McGraw Hill education, 2000.
- Finar, I.L. *Organic Chemistry* (Vol. I & II), E.L.B.S.
- Morrison, R.T. & Boyd, R.N. *Organic Chemistry*, Pearson, 2010.
- Bahl, A. & Bahl, B.S. *Advanced Organic Chemistry*, S. Chand, 2010.
- Pradeep's organic chemistry, Volume I, II
- R Chand, organic chemistry, Volume I,II
- Modern publications, organic chemistry, Volume I,II
- New Age International (P) Ltd, Publishers, Volume I,II.

B. Sc. Ist Year (Ist Semester)
Paper-IV (CHEM-104) Chemistry-I (Practical-I)

Credit : 2
Time : 6 Hrs.

Total Marks =50
(40 EM + 10 IA)

Volumetric Analysis

1. Preparation of reference solutions.
2. Redox titrations: Determination of Fe^{2+} , $\text{C}_2\text{O}_4^{2-}$ (using KMnO_4 , $\text{K}_2\text{Cr}_2\text{O}_7$)
3. Iodometric titrations: Determination of Cu^{2+} (using standard hypo solution).
4. Complexometric titrations: Determination of Mg^{2+} , Zn^{2+} by EDTA.
5. To determine the surface tension of at least two liquids using a stalagmometer by drop no. and drop weight methods (Use of organic solvents excluded).
6. To study the effect of surfactant on surface tension of water.
7. To determine the viscosity of at least two liquids by using Ostwald's viscometer (Use of organic solvents excluded).
8. To determine the specific refractivity of at least two liquids.

Course Outcomes :

CO1: To gain knowledge about Preparation of standard solutions used in the lab.

CO2: Know about Redox , iodometric titrations and complexometric titrations.

CO3: To study the concept of surface tension and its determination by various methods.

CO4: To know about viscosity and its measurements by using Ostwald's viscometer.

Mapping of CO with PO's and PSO's

Paper No. CHEM-104 (Practical)

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P O 13	P O 14	P O 15	P O 16	P O 17	P O 18
CO1	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Scheme of Practical Examination

Duration : 6 Hrs. (Two Session of Three Hours)

Distribution of Marks :

- | | | |
|-----------------|---|----------|
| 1. Experiment 1 | = | 12 Marks |
| 2. Experiment 2 | = | 12 Marks |
| 3. Lab. Record | = | 08 Marks |
| 4. Viva-Voce | = | 08 Marks |

B.Sc. Ist Year (IInd Semester)
Paper-I (CHEM-201) Inorganic Chemistry-II (Theory)

Credit : 2

Time : 3 Hrs.

Total Marks =50

(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Hydrogen Bonding and Vander Waals forces

Hydrogen Bonding – Definition, types, effects of hydrogen bonding on properties of substances, application Brief discussion of various types of Van der Waals forces.

Metallic Bond and semiconductors

Metallic bond – Qualitative idea of valence bond and Band theories of metallic bond (conductors, semiconductors, insulators). Semiconductors – Introduction, types and applications.

s-Block elements

Comparative study of the elements including diagonal relationship, Anomalous behaviour of Lithium and Beryllium compared to other elements in the same group, salient features of hydrides, oxides, halides, hydroxides (methods of preparation excluded), behaviour of solution in liquid NH₃.

Chemistry of Noble Gases

General physical properties, low chemical reactivity, chemistry of xenon, structure and bonding in fluorides, oxides and oxyfluorides of xenon.

Section – B (15 hrs)

p-Block elements:

Electronic configuration, atomic and ionic size, metallic character, melting point, ionization energy, electron affinity, electronegativity, inert pair effect and diagonal relationship.

Boron family (13th group):

Diborane: Preparation, properties and structure (as an example of electron deficient compound and multicenter bonding), Borazine chemical properties and structure, relative strength of Trihalide of Boron as Lewis acids, structure of aluminium(III) chloride.

Carbon family and Nitrogen family (14th and 15th group):

Catenation, Carbides, fluoro carbons, silicates (structural aspects). Oxides: Structure of oxides of nitrogen and phosphorus, Oxyacids : Structure and relative acid strength of oxyacids of nitrogen and phosphorus, structure of white and Red phosphorus.

Oxygen family (16th group):

Oxy acids of sulphur – structure and acidic strength, Hydrogen Peroxide – properties and uses.

Halogen family (17th group):

Interhalogen compounds (their properties and structures), Hydra and oxy acids of chlorine – structure and comparison of acid strength, cationic nature of Iodine.

Course Outcomes :

- CO1:** To know the concept and able to explain types and effect of hydrogen bonding and van der waals forces on properties of substances.
- CO2:** To learn about the various theories of metallic bonding with reference to conductors, insulators and semiconductors and their applications.
- CO3:** To know about the diagonal relationship among S- block elements and about hydrides, oxides, hydroxides and halides of S-block elements.
- CO4:** Learn about chemistry of noble gases with special reference to xenon.
- CO5** To know about the physical and chemical properties of p-block elements.
- CO6:** Have knowledge about the boron family elements their structure, preparation and properties of diborane and borazine.
- CO7:** To learn about the elements of carbon and nitrogen family and concept of catenation, carbides and fluorocarbons.
- CO8:** To know about the elements of oxygen family and have knowledge about the chemical properties of oxides of sulphur.

Mapping of CO with PO's and PSO's

Paper No. CHEM-201

Course Outcome	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	S	M	S	S	S	S	S	S	S	S	M	S	S
CO2	S	S	S	S	S	M	S	S	S	S	S	S	S	S	S	M	S	S
CO3	S	S	S	S	S	S	S	S	M	S	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	M	S	S	M	S	S	S	S	S	S	M	S	S
CO5	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO6	S	S	S	S	S	M	S	S	M	M	S	S	S	S	S	M	S	S
CO7	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO8	S	S	S	S	S	M	M	M	S	S	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference readings

- Lee, J.D. *Concise Inorganic Chemistry* ELBS, 1991.
- Cotton, F.A., Wilkinson, G. & Gaus, P.L. *Basic Inorganic Chemistry*, 3rd ed., Wiley.
- Douglas, B.E., McDaniel, D.H. & Alexander, J.J. *Concepts and Models in Inorganic Chemistry*, John Wiley & Sons.
- Huheey, J.E., Keiter, E.A., Keiter, R.L. & Medhi, O.K. *Inorganic Chemistry: Principles of Structure and Reactivity*, Pearson Education India, 2006.

- Pradeep's inorganic chemistry, Volume I.
- R Chand, inorganic chemistry, Volume I.
- Modern publications, inorganic chemistry, Volume I.

B. Sc. Ist Year (IInd Semester)
Paper-II (CHEM-202) Physical Chemistry-II (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Chemical Kinetics

The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction. Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half-life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only).

Physical Properties and Molecular Structure

Optical activity, polarization – (Clausius – Mossotti equation derivation excluded). Orientation of dipoles in an electric field, dipole moment, induced dipole moment, measurement of dipole moment -temperature method and refractivity method, dipole moment and structure of molecules, Magnetic permeability, magnetic susceptibility and its determination. Application of magnetic susceptibility, magnetic properties – paramagnetism, diamagnetism and ferromagnetism.

Section – B (15 hrs)

Conductance

Conductance, equivalent and molar conductance and their variation with dilution for weak and strong electrolytes. Kohlrausch law of independent migration of ions. Transference number and its experimental determination using Hittorf and Moving boundary methods. Ionic mobility. Applications of conductance measurements: determination of degree of ionization of weak electrolyte, solubility and solubility products of sparingly soluble salts, ionic product of water, hydrolysis constant of a salt. Concepts of pH and pK_a , Buffer solution, Buffer action, Henderson – Hasselbalch equation, Buffer mechanism of buffer action, Conductometric titrations (only acid-base).

Electrochemistry-I

Reversible and irreversible cells. Concept of EMF of a cell. Measurement of EMF of a cell. Nernst equation and its importance. Types of electrodes. Standard electrode potential. Electrochemical series. Thermodynamics of a reversible cell, calculation of thermodynamic properties: ΔG , ΔH and ΔS from EMF data. Calculation of equilibrium constant from EMF data.

Course Outcomes :

- CO1:** To have the knowledge about the concepts of rates of chemical reactions and its applications in derivation of reactions of various orders and half-life
- CO2:** To be able to explain about the physical and magnetic properties associated with various molecular substances
- CO3:** To have information about conductance and its applications to deduce various parameters related to electrolytic solutions, to know about pH and conductometric titrations
- CO4:** Know about Concept of basics of cells their EMF determination by use of Nernst equation and thermodynamic properties

Mapping of CO with PO's and PSO's Paper No CHEM-202

Course Outcome	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P O 13	P O 14	P O 15	P O 16	P O 17	P O 18
CO1	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO2	S	S	S	S	S	S	M	S	M	S	S	S	S	S	S	M	S	S
CO3	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Barrow, G.M. *Physical Chemistry* Tata McGraw-Hill (2007).
- Castellan, G.W. *Physical Chemistry* 4th Ed. Narosa (2004).
- B. R. Puri, Madan S. Pathania , L. R. Sharma *Principles of Physical Chemistry* Vishal Publications.
- Peter Atkins , Julio de Paula , James Keeler *Atkins' Physical Chemistry*, Oxford University Press.
- K.J. Laidler, *Chemical Kinetics*, Perason.

B. Sc. Ist Year (IInd Semester)
Paper-III (CHEM-203) Organic Chemistry-II (Theory)

Credit : 2

Time : 3 Hrs.

Total Marks =50

(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section-A (15 hrs)

Arenes and Aromaticity

Nomenclature of benzene derivatives: Aromatic nucleus and side chain. Aromaticity: the Huckel rule, aromatic ions, annulenes up to 10 carbon atoms, aromatic, anti-aromatic and non-aromatic compounds. Aromatic electrophilic substitution, mechanism of nitration, halogenation, sulphonation, and Friedel-Crafts reaction. Activating, deactivating substituents. Orientation in monosubstituted benzenes.

Alkyl and Aryl Halides

Nomenclature and classes of alkyl halides, methods of formation, chemical reactions. Mechanisms and stereochemistry (inversion and racemization) of nucleophilic substitution reactions of alkyl halides, SN^2 and SN^1 reactions with energy profile diagrams.

Methods of formation and reactions of aryl halides, The addition-elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions.

Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides.

SECTION-B (15 hrs)

Alcohols and Epoxides

Monohydric alcohols: nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding. Acidic nature. Reactions of alcohols. Dihydric alcohols — nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [$Pb(OAc)_4$ and HIO_4] and pinacol-pinacolone rearrangement.

Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening,

Ethers (aliphatic and aromatic): Cleavage of ethers with HI.

Phenols

Nomenclature, structure and bonding. Preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion. Reactions of phenols — electrophilic aromatic substitution, Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction, Kolbe's reaction

Carboxylic Acids & Acid Derivatives

Nomenclature of Carboxylic acids, structure and bonding, physical properties, Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. Mechanism of decarboxylation. Relative stability of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution.

Mechanisms of esterification and hydrolysis (acidic and basic).

Course Outcomes:

CO1: Know about Huckel's rule of aromaticity and various methods of preparation of aromatic Hydrocarbons.

CO2: Get knowledge about the mechanism of S_N1 and S_N2 reactions and other various chemical reactions of aryl and aryl halides.

CO3: Know about alcohols, phenols, ethers, epoxides and their chemical reactions.

CO4: Knowledge about various methods for the preparation of carboxylic acid, carboxylic derivatives (ester, amide, acid chlorides, anhydrides) and their chemical reactions.

Mapping of CO with PO's and PSO's

Paper No. CHEM-203

Course Outcome	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P O 13	P O 14	P O 15	P O 16	P O 17	P O 18
CO1	S	S	S	M	S	M	W	M	W	W	S	S	S	S	S	M	S	S
CO2	S	S	S	M	S	M	W	M	W	W	S	S	S	S	S	M	S	S
CO3	S	S	S	M	S	M	W	M	W	W	S	S	S	S	S	M	S	S
CO4	S	S	S	M	S	M	W	M	W	W	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Graham Solomon, T.W., Fryhle, C.B. & Snyder, S.A. *Organic Chemistry*, John Wiley & Sons (2014).
- McMurry, J.E. *Fundamentals of Organic Chemistry*, 7th Ed. Cengage Learning India Edition, 2013.
- Sykes, P. *A Guidebook to Mechanism in Organic Chemistry*, Orient Longman, New Delhi (1988).
- Finar, I.L. *Organic Chemistry* (Vol. I & II), E.L.B.S.
- Morrison, R.T. & Boyd, R.N. *Organic Chemistry*, Pearson, 2010.
- Bahl, A. & Bahl, B.S. *Advanced Organic Chemistry*, S. Chand, 2010.
- Kotz, J.C., Treichel, P.M. & Townsend, J.R. *General Chemistry* Cengage Learning India Pvt. Ltd., New Delhi (2009).
- Mahan, B.H. *University Chemistry* 3rd Ed. Narosa (1998).
- Petrucci, R.H. *General Chemistry* 5th Ed. Macmillan Publishing Co.: New York (1985).

- Pradeep's organic chemistry, Volume I & II.
- R Chand, organic chemistry, Volume I & II.
- Modern publications, organic chemistry, Volume I & II.
- New Age International (P) Ltd, Publishers, Volume I, II.

B. Sc. Ist Year (IInd Semester)
Paper-IV (CHEM-204) Chemistry-II (Practical)

Credit : 2

Time : 6 Hrs.

Total Marks =50

(40 EM + 10 IA)

- Preparation and purification through crystallization or distillation and ascertaining their purity through melting point or boiling point
 - Iodoform from ethanol (or acetone)
 - m*-Dinitrobenzene from nitrobenzene (use 1:2 conc. HNO_3 - H_2SO_4 mixture if fuming HNO_3 is not available)
 - p-Bromoacetanilide from acetanilide
 - Dibenzalacetone from acetone and benzaldehyde
 - 2,4-DNP derivative of Benzophenone/Acetophenone.
- To study the process of (i) sublimation (ii) Crystallization of camphor and phthalic acid.
- Qualitative Analysis of any one of the following Inorganic cations and anions by paper chromatography (Pb^{2+} , Cu^{2+} , Ca^{2+} , Ni^{2+} , Cl^- , Br^- , I^- , PO_4^{3-} and NO_3^-).

Course Outcomes :

CO1: To learn about ,How to Purify organic compounds by crystallisation(with alcohol and water), sublimation and distillation.

CO2: Able to prepare various organic compounds and also their derivatives.

CO3: To study the process of sublimation and crystallization of camphor and phthalic acid.

CO4: Able to analyze qualitatively inorganic cations and anions using paper chromatography.

Mapping of CO with PO's and PSO's

Paper No. CHEM-204 (Practical)

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P O 13	P O 14	P O 15	P O 16	P O 17	P O 18
CO1	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Scheme of Practical Examination

Duration : 6 Hrs. (Two Session of Three Hours)

Distribution of Marks :

- | | | |
|-----------------|---|----------|
| 1. Experiment 1 | = | 12 Marks |
| 2. Experiment 2 | = | 12 Marks |
| 3. Lab. Record | = | 08 Marks |
| 4. Viva-Voce | = | 08 Marks |

B. Sc. (IIIrd Semester)
Paper-I (CHEM-301) Inorganic Chemistry-III (Theory)

Credit : 2

Time : 3 Hrs.

Total Marks =50

(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Chemistry of d-Block elements

Definition of transition elements, position in the periodic table, General characteristic properties of d-Block elements, Comparison of properties of 3d elements with 4d and 5d elements with reference only to ionic radii, oxidation state, magnetic and spectral properties and stereochemistry. Stability of various oxidation states and e.m.f (Latimer and Frost diagrams), Structure and properties of some compounds of transition elements- TiO_2 , VOCl_2 , FeCl_3 , CuCl_2 and Ni(CO)_4 .

Coordination Compounds

Werner's theory of coordination compounds, effective atomic number, chelates, nomenclature of coordination compounds, Isomerism in coordination compounds, valence bond theory of transition metal complexes.

Section – B (15 hrs)

Chemistry of f-Block elements

Lanthanides: Electronic structure, oxidation states, magnetic properties, complex formation, colour, ionic radii and lanthanide contraction, occurrence, separation of lanthanides, Lanthanide compounds. Actinides: General characteristics of actinides, chemistry of separation of Np, Pu and Am from uranium, Transuranic elements, comparison of properties of Lanthanides and actinides with transition elements.

Course Outcomes :

CO1: Have good knowledge about d-block elements particularly of transition elements.

CO2: To study the comparison between 3d elements with 4d and 5d elements with reference to ionic radii, oxidation state, magnetic properties and spectral properties some compounds of transition elements.

CO3: To know about position of f block elements in periodic table and their general characteristics.

CO4: To study the occurrence and separation of lanthanides and lanthanide compounds.

CO5: Have knowledge of actinides their existence and general properties.

CO6: To compare the properties of Lanthanides and actinides with transition elements.

CO7: To know about the basic concepts of coordination chemistry like EAN, Werner theory of coordination and isomerism in coordination complexes.

Mapping of CO with PO's and PSO's

Paper No. CHEM-301

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13	PO 14	PO 15	PO 16	PO 17	PO 18
CO1	S	S	S	S	S	S	M	S	S	S	S	S	S	S	S	M	S	S
CO2	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	M	S	S
CO3	S	S	S	S	S	M	M	S	S	S	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	M	M	S	S	S	S	S	S	S	S	M	S	S
CO5	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO6	S	S	S	S	S	M	S	S	S	M	S	S	S	S	S	M	S	S
CO7	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books :

- Lee, J.D. *Concise Inorganic Chemistry* ELBS, 1991.
- Cotton, F.A., Wilkinson, G. & Gaus, P.L. *Basic Inorganic Chemistry*, 3rd ed., Wiley.
- Douglas, B.E., McDaniel, D.H. & Alexander, J.J. *Concepts and Models in Inorganic Chemistry*, John Wiley & Sons.
- Huheey, J.E., Keiter, E.A., Keiter, R.L. & Medhi, O.K. *Inorganic Chemistry: Principles of Structure and Reactivity*, Pearson Education India, 2006.
- Pradeep's inorganic chemistry, Volume II.
- R Chand, inorganic chemistry, Volume II.
- Modern publications, inorganic chemistry, Volume II.

B.Sc. IInd Year (IIIrd Semester)
Paper-II (CHEM-302) Physical Chemistry-III (Theory)

Credit : 2

Time : 3 Hrs.

Total Marks =50

(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Energetics

Recapitulation of thermodynamics and the Laws of Thermodynamics. Joule–Thomson coefficient for ideal gas and real gas and inversion temperature. Important principles and definitions of thermochemistry. Concept of standard state and standard enthalpies of formations, integral and differential enthalpies of solution and dilution. Calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data. Variation of enthalpy of a reaction with temperature – Kirchhoff's equation. Statement of Third Law of thermodynamics and calculation of absolute entropies of substances.

Electrochemistry-II

Concentration cells with transference and without transference. Liquid junction potential and salt bridge. pH determination using hydrogen electrode and quinhydrone electrode. Potentiometric titrations -qualitative treatment (acid-base and oxidation-reduction only).

Section – B (15 hrs)

Chemical Equilibrium

Equilibrium constant and free energy, concept of chemical potential. Thermodynamic derivation of the law of chemical equilibrium. Temperature dependence of equilibrium constant. Distinction between ΔG and ΔG° , Le Chatelier's principle. Relationships between K_p , K_c and K_x for reactions involving ideal gases. Clausius–Clapeyron equation and its applications. Nernst distribution law and its applications.

Phase Equilibrium

Phases, components and degrees of freedom of a system, criteria of phase equilibrium. Gibbs Phase Rule and its thermodynamic derivation. Derivation of Clausius – Clapeyron equation and its importance in phase equilibria. Phase diagrams of one-component systems (water and sulphur) and two component systems involving eutectics (Pb-Ag system only), desilverisation of lead.

Course Outcomes :

- CO1:** To know about the laws and concepts of chemical thermodynamics and their applications in thermochemical calculations.
- CO2:** To have knowledge about electrolytic concentration cells with and without transference and their EMF calculation, applications of the concept to determine liquid junction potential, pH determination using potentiometry and potentiometric titrations.
- CO3:** To understand the basic terms related to chemical equilibrium and derive the law thermodynamically, deduce relation between various equilibrium constants and determining partition coefficient of a solvent dissolved in two immiscible solvents.
- CO4:** To have good knowledge about fundamental concepts of phase equilibrium and their applications in studying one and two-component systems including eutectics.

Mapping of CO with PO's and PSO's
Paper No CHEM-302

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO2	S	S	S	S	S	S	M	S	M	S	S	S	S	S	S	M	S	S
CO3	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Barrow, G.M. *Physical Chemistry* Tata McGraw-Hill (2007).
- Castellan, G.W. *Physical Chemistry* 4th Ed. Narosa (2004).
- B. R. Puri, Madan S. Pathania , L. R. Sharma *Principles of Physical Chemistry* Vishal Publications.
- Peter Atkins , Julio de Paula , James Keeler *Atkins' Physical Chemistry*, Oxford University Press.
- S.Glasstone, *An Introduction To Electrochemistry*, Affiliated East- West Press Pvt. Limited, New Delhi.
- S. Glasstone *Thermodynamics For Chemists*.

B.Sc. IInd Year (IIIrd Semester)
Paper-III (CHEM-303) Organic Chemistry-III (Theory)

Credit : 2

Time : 3 Hrs.

Total Marks =50

(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B(not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Ultraviolet (UV) absorption spectroscopy

Absorption laws (Beer-Lambert law), molar absorptivity, presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation. Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated enes and enones, Woodward-Fieser rules, calculation of λ_{max} of simple conjugated dienes and $\alpha\beta$ -unsaturated ketones (upto one DB extension).

Infrared (IR) absorption spectroscopy

Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum, fingerprint region, characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds (Acetaldehyde, acetone, nitrobenzene, methylbenzoate, phenylacetate, aniline, phenol).

Amines

Structure and nomenclature of amines, physical properties. Separation of a mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines.

Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles, reductive amination of aldehydic and ketonic compounds. Gabriel phthalimide reaction, Hofmann bromamide reaction. Electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid.

Section – B (15 hrs)

Diazonium Salts

Mechanism of diazotization, structure of benzene diazonium chloride, Replacement of diazo group by H, OH, F, Cl, Br, I, NO₂ and CN groups, reduction of diazonium salts to hydrazines and coupling reaction.

Aldehydes and Ketones

Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, advantage of oxidation of alcohols with chromium trioxide (Sarett reagent) pyridinium chlorochromate (PCC) and pyridinium dichromate. Physical properties, Comparison of reactivities of aldehydes and ketones. Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevenagel condensations. Condensation with ammonia and its derivatives. Wittig reaction.

Mannich reaction. Oxidation of aldehydes, Baeyer– Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, LiAlH_4 and NaBH_4 reductions.

Enolates

Keto-enol tautomerism of ethyl acetoacetate, Acidity of α -hydrogens, alkylation of diethyl malonate (synthesis of butyric acid, isovaleric acid) and ethyl acetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation.

Course Outcomes:

CO1: Have knowledge of various absorption laws (Beer-Lambert law), molar absorptivity, analysis UV spectra and application of UV spectroscopy in structure elucidation.

CO2: Able To describe absorptions of various functional groups and applications of IR spectroscopy.

CO3: To synthesize and know reactions of amines.

CO4: To discuss synthetic application of diazonium salt.

CO5: Know about the preparation of aliphatic, aromatic aldehydes and ketones and various important name reactions of aldehydes and ketones.

CO6: Get knowledge about the acidity of α -hydrogens of diethyl malonate, ethyl acetoacetate and the synthesis and Keto-enol tautomerism of ethyl acetoacetate.

Mapping of CO with PO's and PSO's

Paper No. CHEM-303

Course Outcome	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO2	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO3	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO4	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO5	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO6	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Brian Smith: Infrared Spectral Interpretations: A Systematic Approach.
- Kotz, J.C., Treichel, P.M. & Townsend, J.R. *General Chemistry*, Cengage Learning India Pvt. Ltd.: New Delhi (2009).
- Mahan, B.H. *University Chemistry*, 3rd Ed. Narosa (1998).
- Petrucci, R.H. *General Chemistry*, 5th Ed., Macmillan Publishing Co.: New York (1985).

- Morrison, R. T. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. *Organic Chemistry (Volume 1)*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. *Organic Chemistry (Volume 2)*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Pradeep's organic chemistry, Volume II & III.
- R Chand, organic chemistry, Volume II & III.
- Modern publications, organic chemistry, Volume II & III.
- New Age International (P) Ltd, Publishers, Volume II.

B.Sc. IInd Year (IIIrd Semester)
Paper-IV (CHEM-304) Chemistry-III (Practical)

Credit : 2
Time : 6 Hrs.

Total Marks =50
(40 EM + 10 IA)

- 1 Colorimetry:
To verify Beer - Lambert law for KMnO_4 / $\text{K}_2\text{Cr}_2\text{O}_7$ and determine the concentration of the given KMnO_4 / $\text{K}_2\text{Cr}_2\text{O}_7$ solution.
- 2 Preparations: Preparation of Cuprous chloride, tetra ammine cupric sulphate, chrome alum, potassium trioxalatochromate(III) and Nickel Hexamine chloride.
- 3 To determine the Critical Solution Temperature of phenol – water system.
- 4 To determine the solubility of benzoic acid at various temperatures and to determine the ΔH of the dissolution process.
- 5 To determine the enthalpy of neutralisation of a weak acid/weak base vs. strong base/strong acid and determine the enthalpy of ionisation of the weak acid/weak base.
- 6 To determine the enthalpy of solution of solid calcium chloride.
- 7 To study the distribution of Benzoic Acid between Benzene and water.
- 8 Determine rate constant of hydrolysis of ethyl acetate.

Course Outcomes:

- CO1:** To verify the Beer's lambert law using potassium permanganate and potassium dichromate and also quantitation of these analytes.
- CO2:** To prepare simple coordination complexes viz. Cuprous chloride, tetra-ammine cupric sulphate, chrome alum, potassium trioxalatochromate(III) and Nickel Hexamine chloride.
- CO3:** Able to find out critical solution temperature of phenol water system.
- CO4:** To determine the enthalpy of solution of calcium chloride enthalpy of neutralization and ionization using different combinations of acids and bases.
- CO5:** To perform hydrolysis of ethyl acetate and find out rate constant of the reaction.

Mapping of CO with PO's and PSO's

Paper No. CHEM-304 (Practical)

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P O 13	P O 14	P O 15	P O 16	P O 17	P O 18
CO1	S	S	S	S	S	S	W	S	M	S	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	W	S	M	S	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	W	S	M	S	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	W	S	M	S	S	S	S	M	S	S	S	S
CO5	S	S	S	S	S	S	W	S	M	S	S	S	S	M	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Scheme of Practical Examination

Duration : 6 Hrs. (Two Session of Three Hours)

Distribution of Marks :

- | | | |
|-----------------|---|----------|
| 1. Experiment 1 | = | 12 Marks |
| 2. Experiment 2 | = | 12 Marks |
| 3. Lab. Record | = | 08 Marks |
| 4. Viva-Voce | = | 08 Marks |

B. Sc. II Year (IVth Semester)
Paper-I (CHEM-401) Inorganic Chemistry-IV (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs.)

Metal- Ligand Bonding in Transition Metal complexes

Limitations of valence bond theory, an elementary idea of crystal field theory, crystal field splitting in octahedral, tetrahedral and square planar complexes, factors affecting the crystal field parameters.

Thermodynamics and Kinetic Aspects of metal complexes

A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, Irving William Series, substitution reactions of square planar complexes of Pt[II], Trans effect.

Magnetic properties of Transition metal complexes

Types of magnetic materials, magnetic susceptibility, method of determining magnetic susceptibility, spin only formula, L-S coupling, correlation of μ_s and μ_{eff} values, orbital contribution to magnetic moments, application of magnetic moment data for 3d metal complexes.

Section –B (15 hrs.)

Electronic spectra of Transition metal complexes

Selection rules for d-d transition, spectroscopic ground states, spectrochemical series, Orgel energy level diagram for d^1 and d^9 states, discussion of electronic spectrum of $[\text{Ti}(\text{H}_2\text{O})_6]^{+3}$ complex ion.

Theory of Qualitative and Quantitative Analysis

Chemistry of analysis of various groups of basic and acidic radicals, chemistry of identification of acid radicals in typical combination, chemistry of interference of acid radicals including their removal in the analysis of basic radicals, common ion effect, solubility product, theory of precipitation, co-precipitation, post precipitation, purification of precipitates.

Course Outcomes :

- CO1:** To recapitulate the concept of valence bond theory and know the concept of crystal field theory with reference to splitting of d orbital's in octahedral, tetrahedral and square planar complexes and factors affecting the crystal field parameters.
- CO2:** To explain the factors responsible for the stability of coordination complexes and various substitution reactions of square planar complexes with reference to trans effect.
- CO3:** To study the magnetic properties of transition metal complexes and various types of magnetic materials and their magnetic susceptibility.
- CO4:** To explain the methods for the determination of magnetic susceptibility.

CO5: To apply the magnetic moment data for 3d metal complexes and study the selection rules for the d-d transitions.

CO5: Able to calculate the spectroscopic terms for various metal ions.

CO6: Have knowledge about orgal level diagrams for d^1 and d^9 electronic states and the electronic spectrum of $[\text{Ti}(\text{H}_2\text{O})_6]^{+3}$ complex ion.

Mapping of CO with PO's and PSO's

Paper No. CHEM-401

Course Outcome	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	M	M	S	S	S	S	S	S	S	S	M	S	S
CO2	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	M	S	S
CO3	S	S	S	S	S	S	M	S	M	S	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	S	M	S	M	S	S	S	S	S	S	M	S	S
CO5	S	S	S	S	S	S	M	W	M	S	S	S	S	S	S	M	S	S
CO6	S	S	S	S	S	S	S	W	M	M	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Lee, J.D. *Concise Inorganic Chemistry* ELBS, 1991.
- Cotton, F.A., Wilkinson, G. & Gaus, P.L. *Basic Inorganic Chemistry*, 3rd ed., Wiley.
- Douglas, B.E., McDaniel, D.H. & Alexander, J.J. *Concepts and Models in Inorganic Chemistry*, John Wiley & Sons.
- Huheey, J.E., Keiter, E.A., Keiter, R.L. & Medhi, O.K. *Inorganic Chemistry: Principles of Structure and Reactivity*, Pearson Education India, 2006.
- Pradeep's inorganic chemistry, Volume III.
- R Chand, inorganic chemistry, Volume III.
- Modern publications, inorganic chemistry, Volume III.
- Coordination chemistry by Ajai kumar, Aaryush publications, Delhi.

B. Sc. IInd Year (IVth Semester)
Paper II (CHEM-402) Physical Chemistry-IV (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Quantum Mechanics-I

Black-body radiation, Planck's radiation law, photoelectric effect, postulates of quantum mechanics, quantum mechanical operators, Role of operators in quantum mechanics, commutation relations, Hamiltonian operator, Hermitian operator, average value of square of Hermitian as a positive quantity. Schrödinger equation (basic idea), Determination of wave function & energy of a particle in one dimensional box.

Introduction to Statistical Mechanics

Need for statistical thermodynamics, thermodynamic probability, Maxwell-Boltzmann distribution statistics, Born oppenheimer approximation, partition function and its physical significance. Factorization of partition function.

Section – B (15 hrs)

Spectroscopy

Introduction: Electromagnetic radiation, regions of spectrum, basic features of spectroscopy, statement of Born-Oppenheimer Approximation, Degrees of freedom.

Rotational Spectrum

Selection rules, Energy levels of rigid rotator (semi-classical principles), rotational spectra of diatomic molecules, spectral intensity distribution using population distribution (Maxwell-Boltzmann distribution), determination of bond length and isotopic effect.

Vibrational spectrum

Selection rules, Energy levels of simple harmonic oscillator, pure vibrational spectrum of diatomic molecules, determination of force constant and qualitative relation of force constant and bond energy, idea of vibrational frequencies of different functional groups.

Raman Spectrum

Concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules, Quantum theory of Raman spectra. Give more stress on numerical problems of all spectroscopy.

Course Outcomes :

CO1: To know about dual characteristic of matter and extend this fact to obtain postulates of quantum mechanics and quantum-mechanical operators, apply Schrödinger equation to determine the physical observables for particle in a box.

CO2: To understand the need of statistical mechanics and Maxwell-Boltzmann distribution, partition function and its significance.

CO3: To have sound knowledge about the consequences of interaction of radiation with matter resulting into various types of spectra.

CO4: To be able to solve various numerical problems related to spectroscopy.

Mapping of CO with PO's and PSO's

Paper No CHEM-402

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO2	S	S	S	S	S	S	M	S	M	S	S	S	S	S	S	M	S	S
CO3	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	M	M	S	M	S	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Barrow, G.M. *Physical Chemistry* Tata McGraw-Hill (2007).
- Castellan, G.W. *Physical Chemistry* 4th Ed. Narosa (2004).
- B. R. Puri, Madan S. Pathania, L. R. Sharma *Principles of Physical Chemistry* Vishal Publications.
- Chandra, A. K. *Introductory Quantum Chemistry* Tata McGraw-Hill (2001).
- House, J. E. *Fundamentals of Quantum Chemistry* 2nd Ed. Elsevier: USA(2004).
- Lowe, J. P. & Peterson, K. *Quantum Chemistry*, Academic Press (2005).
- Banwell, C. N. & McCash, E. M. *Fundamentals of Molecular Spectroscopy* 4th Ed. Tata McGraw-Hill: New Delhi (2006).
- Pradeep's physical chemistry, Volume III.
- R Chand, physical chemistry, Volume III.
- Modern publications, physical chemistry, Volume III.

B. Sc. IInd Year (IVth Semester)
Paper-III (CHEM-403) Organic Chemistry-IV (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

NMR Spectroscopy

Principle of nuclear magnetic resonance, the PMR spectrum, number of signals, peak areas, magnetic equivalent and nonequivalent protons, positions of signals and chemical shift, shielding and deshielding of protons, proton counting, splitting of signals and coupling constant. Discussion of PMR spectra of the molecules: ethyl bromide, n-propyl bromide, isopropyl bromide, 1,1-dibromoethane, ethanol, acetaldehyde, ethyl acetate, toluene, benzaldehyde and acetophenone.

Organometallic Compounds

Grignard reagents: formation, structure and chemical reactions. Organozinc compounds: formation and chemical reactions. Organolithium compounds: formation and chemical reactions. Reactions of Grignard and organolithium reagents with epoxides.

Section – B (15 hrs)

Carbohydrates

Classification and nomenclature of Monosaccharides, mechanism of osazone formation, interconversion of glucose, fructose and mannose, chain lengthening and chain shortening of aldoses. Configuration of monosaccharides. Determination of ring size of glucose and fructose. Open chain and cyclic structure of D(+)-glucose & D(-) fructose. Mechanism of mutarotation. An introduction to disaccharides (maltose, sucrose and lactose; reducing and non-reducing) and polysaccharides (starch and cellulose) without involving structure determination.

Amino Acids and Peptides sequencing

Classification α -of amino acids. Acid-base behavior, isoelectric point, Preparation (Gabriel phthalimide, Erlenmeyer azlactone, Strecker method) and properties of α -amino acids (ester of $-\text{COOH}$ group, acetylation of $-\text{NH}_2$ group, complexation with Cu^{2+} ions, ninhydrin test, Hydantoin formation), Structure and nomenclature of peptides, Peptide structure determination, end group analysis (DNFB, Edman thiohydantoin and carboxypeptidase method), selective hydrolysis of peptides.

Introduction to Heterocyclic Compounds

Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Comparison of basicity of pyridine, piperidine and pyrrole.

Course Outcomes:

CO1: Get knowledge about the principle of nuclear magnetic resonance and the PMR spectra of the

various molecules.

CO2: Brief description of organometallic compounds.

CO3: To have knowledge about classification, structures and important reactions of carbohydrates and amino acids.

CO4: Get knowledge aromatic behaviour and basicity of simple heterocyclic compounds.

Mapping of CO with PO's and PSO's

Paper No. CHEM-403

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	M	S	S	W	M	W	W	S	S	S	S	S	M	S	S
CO2	S	S	S	M	S	M	W	M	W	W	S	S	S	S	S	M	S	S
CO3	S	S	S	M	S	M	W	M	W	W	S	S	S	S	S	M	S	S
CO4	S	S	S	M	S	M	W	M	W	W	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Morrison, R. T. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- C.N. Banwell: Fundamentals of Molecular Spectroscopy.
- Finar, I. L. *Organic Chemistry (Volume 2)*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Berg, J.M., Tymoczko, J.L. & Stryer, L. *Biochemistry*, W.H. Freeman, 2002.
- Nelson, D. L. & Cox, M. M. *Lehninger's Principles of Biochemistry 7th Ed.*, W. H. Freeman.
- Berg, J.M., Tymoczko, J.L. & Stryer, L. *Biochemistry*, W.H. Freeman, 2002.
- Pradeep's organic chemistry, Volume III.
- R Chand, organic chemistry, Volume III.
- Modern publications, organic chemistry, Volume III.
- New Age International (P) Ltd, Publishers Volume, I and III.

B. Sc. IInd Year (IVth Semester)
Paper-IV (CHEM-404) Chemistry-IV (Practical)

Credit : 2
Time : 6 Hrs.

Total Marks =50
(40 EM + 10 IA)

1. Systematic identification (detection of extra elements, functional groups, determination of melting point or boiling point and preparation of at least one pure solid derivative) of the following simple mono and bifunctional organic compounds: Naphthalene, anthracene, acenaphthene, benzyl chloride, *p*-dichlorobenzene, *m*-dinitrobenzene, *p*-nitrotoluene, resorcinol, hydroquinone, -naphthol, -naphthol, benzophenone, ethyl methyl ketone, benzaldehyde, vanillin, oxalic acid, succinic acid, benzoic acid, salicylic acid, aspirin, phthalic acid, cinnamic acid, benzamide, urea, acetanilide, benzanilide, aniline hydrochloride, *p*-toluidine, phenyl salicylate (salol), glucose, fructose, sucrose, *o*-, *m*-, *p*-nitroanilines, thiourea.

2. Gravimetric Analysis:

Quantitative estimations of, Cu^{2+} as copper thiocyanate, Ni^{2+} as Ni– dimethylglyoxime and Al^{3+} as oxinate.

Course Outcomes:

CO1: To identify extra elements present in various solid organic compounds.

CO2: Able to identify functional group present in organic compounds.

CO3: Able to measure melting point, solubility behaviour, pH range, flame testing etc. of organic Compounds.

CO4: To perform gravimetric analysis and also able to analyze quantitatively copper, nickel and aluminium in the given solution.

Mapping of CO with PO's and PSO's

Paper No. CHEM-404 (Practical)

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P O 13	P O 14	P O 15	P O 16	P O 17	P O 18
CO1	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Scheme of Practical Examination

Duration : 6 Hrs. (Two Session of Three Hours)

Distribution of Marks :

- | | | |
|-----------------|---|----------|
| 1. Experiment 1 | = | 12 Marks |
| 2. Experiment 2 | = | 12 Marks |
| 3. Lab. Record | = | 08 Marks |
| 4. Viva-Voce | = | 08 Marks |

B. Sc. IIIrd Year (Vth Semester)
Paper-I (CHEM-501-I) (Heterocyclic and Photochemistry) (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carries 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section - A (15 Hrs.)

Heterocyclic compounds

Recapitulation of concept of Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Comparison of basicity of pyridine, piperidine and pyrrole. Mechanism of nucleophilic substitution reactions in pyridine derivatives. Introduction to condensed five and six-membered heterocycles. Preparation and reactions of indole, quinoline and isoquinoline with special reference to Fisher indole synthesis, Skraup synthesis and Bischler-Napieralski synthesis. Mechanism of electrophilic substitution reactions of, quinoline and isoquinoline.

Section - B (15 Hrs.)

Photochemistry:

Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grotthus-Draper law, Stark-Einstein law (law of photochemical equivalence), Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions-energy transfer processes (simple examples), chemiluminescence. Brief introduction and description of photochemical reactions of simple carbonyl compounds, alkenes and aromatic compounds, Barton Reaction, Hofmann-Löffler-Freytag reaction.

Course Outcomes:

- CO1:** Knowledge about condensed five and six-membered heterocyclic rings, basicity of pyridine, piperidine and pyrrole and the preparation and reactions of indole, quinoline and isoquinoline.
- CO2:** Basic information of photochemistry and laws of photochemistry.
- CO3:** To learn about Phosphorescence and fluorescence.

Mapping of CO with PO's and PSO's
Paper No. CHEM-501-I

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S 1	P S 2	P S 3	P S 4	P S 5	P S 6	P S 7
CO1	S	S	S	S	S	M	W	S	M	W	S	S	S	S	S	S	M	S	S
CO2	S	S	S	S	S	S	W	S	M	W	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	W	S	M	W	S	S	S	S	S	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Seymour, R. B. & Carraher, C.E. *Polymer Chemistry: An Introduction*, Marcel Dekker, Inc. New York, 1981.
- Odian, G. *Principles of Polymerization*, 4th Ed. Wiley, 2004.
- Billmeyer, F.W. *Textbook of Polymer Science*, 2nd Ed. Wiley Interscience, 1971.
- Ghosh, P. *Polymer Science & Technology*, Tata McGraw-Hill Education, 1991.
- K. K. Rohatgi, Mukherjee, *Fundamentals of Photochemistry*, New Age International.
- Pradeep's organic chemistry, Volume III.
- R Chand, organic chemistry, Volume III.
- Modern publications, organic chemistry, Volume III.
- New Age International (P) Ltd, Publishers, Volume III.

B. Sc. IIIrd Year (Vth Semester)
Paper-I (CHEM-501-II) (Bio-organic Chemistry) (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Nucleic Acids

Components of Nucleic acids: Adenine, guanine, thymine and Cytosine (Structure only), other components of nucleic acids, Nucleosides and nucleotides (nomenclature), Structure of polynucleotides; Structure of DNA (Watson-Crick model).

Peptides and Proteins

Structural and functional classification of proteins. Primary & Secondary structures of peptides and proteins, Tertiary and Quaternary structure of proteins. Synthesis of simple peptides (upto dipeptides) by N-protection (t-butyloxycarbonyl and phthaloyl) & C-activating groups and Merrifield solid phase synthesis.

Section – B (15 hrs)

Lipids

Introduction to lipids and their classification. Waxes-Introduction, structure and functions of bees wax, wool Wax, spermaceti wax, carnauba wax. Fatty acid classification-cis and trans fatty acid, saturated and unsaturated fatty acid, Essential fatty acids and their functions, Structure and functions of triacylglycerol and sphingolipids. Fluid mosaic model of cell membrane.

Concept of Energy in Biosystems

Calorific value of food. Standard caloric content of carbohydrates, proteins and fats. Oxidation of foodstuff (organic molecules) as a source of energy for cells. Introduction to Metabolism (catabolism, anabolism), ATP: the universal currency of cellular energy, ATP hydrolysis and free energy change.

Course Outcomes :

CO1: Know about nucleic acids, nucleosides and nucleotides.

CO2: Structure of DNA and RNA.

CO3: Know about concept of lipids and their classification.

CO4: Have knowledge about Structural and functional classification of proteins.

Mapping of CO with PO's and PSO's

Paper No. CHEM-501-II

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO2	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO3	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO4	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

B. Sc. IIIrd Year (Vth Semester)
Paper-II (CHEM-502-I) (Organometallic Chemistry, Inorganic Polymers and Quantum Mechanics) (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on the whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Organometallic chemistry

Definition, classification and nomenclature of organometallic compounds, preparation, properties and bonding of alkyls of Li, Al, Hg and Sn, concept of hapticity of organic ligand, Structure and bonding in metal-ethylenic complexes, Structure of Ferrocene, classification in metal carbonyls, preparation, properties and bonding in mononuclear carbonyls.

Silicones and Phosphazenes

Nomenclature, classification, preparation and uses of silicones, elastomers, polysiloxane copolymers, poly phosphazenes and bonding in triphosphazene.

Section – B (15 hrs)

Quantum Mechanics-II

To show quantum mechanically that position and momentum cannot be predicated simultaneously, Extension of Schrödinger wave equation to two and three dimensional boxes, separation of variables, probability distribution, energy, degeneracy.

Qualitative treatment of simple harmonic oscillator model of vibrational motion: Setting up of Schrödinger equation and discussion of solution and wavefunctions. Vibrational energy of diatomic molecules and zero-point energy.

Angular momentum: Commutation rules, quantization of square of total angular momentum and z-component.

Rigid rotator model of rotation of diatomic molecules. Schrödinger equation, transformation to spherical polar coordinates. Separation of variables. Spherical harmonics. Discussion of solution.

Course Outcomes :

CO1: To study the nomenclature, classification, preparation and bonding in organometallic compounds and of metal carbonyls also.

CO2: To know about various inorganic clusters compounds with special reference to silicones and phosphazenes.

CO3: To have sound knowledge about the concepts of dual nature of matter and its applications to obtain Schrödinger wave equation and angular momentum.

CO4: To solve Schrödinger equation for a particle present in various systems viz., two and three-dimensional boxes, harmonic oscillator and rigid rotator.

Mapping of CO with PO's and PSO's

Paper No. CHEM-502-I

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	S	M	S	M	W	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	M	S	M	W	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	M	M	S	M	W	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	M	M	S	M	W	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference books

- B. R. Puri, Madan S. Pathania , L. R. Sharma *Principles of Physical Chemistry* Vishal Publications.
- Chandra, A. K. *Introductory Quantum Chemistry* Tata McGraw-Hill (2001).
- House, J. E. *Fundamentals of Quantum Chemistry* 2nd Ed. Elsevier: USA (2004).
- Lowe, J. P. & Peterson, K. *Quantum Chemistry*, Academic Press (2005).
- Pradeep's organic chemistry, Volume II and III.
- R Chand, organic chemistry, Volume III.
- Modern publications, organic chemistry, Volume II and III.
- New Age International (P) Ltd, Publishers, Volume II and III.

B. Sc. IIIrd Year (Vth Semester)
Paper-II (CHEM-502-II) ((Applied Chemistry) (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. Q.No.1, based on whole syllabus, is compulsory. There will be four questions from section A and four from section B. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 6 marks each.

Section – A (15 hrs)

Bio inorganic chemistry

Metal ions present in biological system, classification on the basis of action (essential, non essential, trace, toxic), Metalloporphyrins with special reference to haemoglobin and myoglobin. Biological role of Na^+ , K^+ , Ca^{+2} , Mg^{+2} , Fe^{+2} ions, Cooperative effect, Bohr effect.

Acids and Bases

Arrhenius, Bronsted-lowry, Lux-flood, solvent system and Lewis concept of acids and bases, relative strength of acids and bases, levelling solvents, hard and soft acids and bases(HSAB), Applications of HSAB principle.

Section – B (15 hrs)

Chemical Bonding

Chemical bonding: Covalent bonding, valence bond and molecular orbital approaches, LCAO-MO treatment of H_2^+ . Bonding and antibonding orbitals. Qualitative extension to H_2 . Comparison of LCAO-MO and VB treatments of H_2 (only wavefunctions, detailed solution not required) and their limitations.

Spectroscopy-II

Electronic spectroscopy: Franck-Condon principle, electronic transitions, singlet and triplet states, fluorescence and phosphorescence, dissociation and predissociation, calculation of electronic transitions of polyenes using free electron model.

Nuclear Magnetic Resonance (NMR) spectroscopy: Principles of NMR spectroscopy, Larmor precession, chemical shift and low resolution spectra, different scales, spin-spin coupling and high resolution spectra, interpretation of PMR spectra of organic molecules.

Electron Spin Resonance (ESR) spectroscopy: Its principle, hyperfine structure, ESR of simple radicals.

Course Outcomes :

- CO1:** To know about basic concepts of bioinorganic chemistry with reference to metal ions present in biological systems.
- CO2:** To study the biochemistry of dioxygen carriers especially hemoglobin and myoglobin.
- CO3:** Introduce the concept of acids and bases to the students and also able to explain the various theories associated with them.

CO4: To understand and apply valence bond and molecular orbital approaches to the treatment of hydrogen molecule and its ion.

CO5: To have sound knowledge of the concept of interaction of electromagnetic radiation with matter and to be able to describe electronic, NMR and ESR spectra of various molecules.

Mapping of CO with PO's and PSO's

Paper No. CHEM-502-II

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	S	W	M	M	W	S	S	S	M	S	S	S	S	S
CO2	S	S	S	S	S	S	W	M	M	W	S	S	S	M	S	S	S	S	S
CO3	S	S	S	S	S	S	W	M	M	W	S	S	S	M	S	S	S	S	S
CO4	S	S	S	S	S	M	W	S	M	W	S	S	S	S	S	M	S	S	S
CO5	S	S	S	S	S	M	W	S	M	W	S	S	S	S	S	M	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Pradeep's Organic Chemistry, Volume II and III.
- R Chand, Organic Chemistry, Volume III.
- Modern publications, Organic Chemistry, Volume II and III.
- New Age International (P) Ltd, Publishers, Volume III.

B. Sc. IIIrd Year (Vth Semester)
Paper-III (CHEM-503-I) (Chemistry Practical – V)

Credit : 2
Time : 6 Hrs.

Total Marks =50
(40 EM + 10 IA)

Semimicro qualitative analysis of mixture containing not more than four radicals (excluding interfering, Combinations and insoluble's): Pb^{2+} , Hg^{2+} , Hg_2^{2+} , Ag^+ , Bi^{3+} , Cu^{2+} , Cd^{2+} , As^{3+} , Sb^{3+} , Sn^{2+} , Fe^{3+} , Cr^{3+} , Al^{3+} , Co^{2+} , Ni^{2+} , Mn^{2+} , Zn^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , Mg^{2+} , NH_4^+ , CO_3^{2-} , S^{2-} , SO_3^{2-} , $\text{S}_2\text{O}_3^{2-}$, NO_2^- , CH_3COO^- , Cl^- , Br^- , I^- , NO_3^- , SO_4^{2-} , $\text{C}_2\text{O}_4^{2-}$, PO_4^{3-} , BO_3^{3-}

Thin Layer Chromatography

(Determination of R_f values and identification of organic Compounds) Separation of a mixture of coloured organic compounds using common organic solvents.

Find out the temporary and permanent hardness in given water sample by EDTA method.

Course Outcomes:

CO1: To analyze the given inorganic mixture qualitatively for various cations and anions present in them.

CO2: Able to determine R_f values.

CO3: Identification of organic compounds.

CO4: Able to perform thin layer chromatography to separate various components present in the Mixture, determination of hardness of water.

Mapping of CO with PO's and PSO's

Paper No. CHEM-503 (Practical)

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P O 13	P O 14	P O 15	P O 16	P O 17	P O 18
CO1	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Scheme of Practical Examination

Duration : 6 Hrs. (Two Session of Three Hours)

Distribution of Marks :

- | | | |
|-----------------|---|----------|
| 1. Experiment 1 | = | 12 Marks |
| 2. Experiment 2 | = | 12 Marks |
| 3. Lab. Record | = | 08 Marks |
| 4. Viva-Voce | = | 08 Marks |

B. Sc. IIIrd Year (Vth Semester)
Paper-III (CHEM-503-II) (Chemistry Practical – V)

Credit : 2
Time : 6 Hrs.

Total Marks =50
(40 EM + 10 IA)

Semimicro qualitative analysis of mixture containing not more than four radicals (excluding interfering, Combinations and insoluble's): Pb^{2+} , Hg^{2+} , Hg_2^{2+} , Ag^+ , Bi_3^+ , Cu^{2+} , Cd^{2+} , As^{3+} , Sb^{3+} , Sn^{2+} , Fe^{3+} , Cr^{3+} , Al^{3+} , Co^{2+} , Ni^{2+} , Mn^{2+} , Zn^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , Mg^{2+} , NH_4^+ , CO_3^{2-} , S^{2-} , SO_3^{2-} , $\text{S}_2\text{O}_3^{2-}$, NO_2^- , CH_3COO^- , Cl^- , Br^- , I^- , NO_3^- , SO_4^{2-} , $\text{C}_2\text{O}_4^{2-}$, PO_4^{3-} , BO_3^{3-}

Thin Layer Chromatography

(Determination of R_f values and identification of organic Compounds) Separation of a mixture of coloured organic compounds using common organic solvents.

Find out the total dissolved solids present in given water sample.

Course Outcomes:

CO1: To analyze the given inorganic mixture qualitatively for various cations and anions present in them.

CO2: Able to determine R_f values.

CO3: Identification of organic compounds.

CO4: Able to perform thin layer chromatography to separate various components present in the Mixture and determination of TDS of water.

Mapping of CO with PO's and PSO's

Paper No. CHEM-503 (Practical)

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P O 13	P O 14	P O 15	P O 16	P O 17	P O 18
CO1	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Scheme of Practical Examination

Duration : 6 Hrs. (Two Session of Three Hours)

Distribution of Marks :

- | | | |
|-----------------|---|----------|
| 1. Experiment 1 | = | 12 Marks |
| 2. Experiment 2 | = | 12 Marks |
| 3. Lab. Record | = | 08 Marks |
| 4. Viva-Voce | = | 08 Marks |

B. Sc. IIIrd Year (VIth Semester)
Paper-I (CHEM-601-I) Applied Physical Chemistry (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. **Q.No.1**, based on whole syllabus, is compulsory. There will be four questions from section **A** and four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carries 12 marks and all questions in Section A & B (not more than 2-3 parts) carry 12 marks each.

Section – A (15 hrs)

Surface Chemistry

Adsorption by solids, Chemisorption, Applications of adsorption, Adsorption of gases by solids, Factors influencing adsorption, The Freundlich adsorption isotherm, The Langmuir theory of adsorption, The BET theory of multilayer adsorption, Derivation of the BET equation, Types of adsorption isotherms, Adsorption from solution, The Gibbs adsorption isotherm.

Synthetic Dyes

Colour and constitution (electronic concept). Classification of dyes. Chemistry and synthesis of Methyl orange, Congo red, Malachite green, Crystal violet, Phenolphthalein, Fluorescein, Alizarin and Indigo.

Section – B (15 hrs)

Liquid Crystals

The Mesomorphic State, Liquid crystals and its classification, Uses of liquid crystals. Surfactants, its types and methods to determine critical micelle concentration (Electrical conductivity and surface tension), Emulsions, Emulsifiers, Gels, Elastic and non-elastic gels.

Macromolecules

Macromolecules, Molar mass of polymers, Determination of molar masses of macromolecules, Thermodynamics of polymer solution.

Course Outcomes:

- CO1:** Have knowledge about concept of surface chemistry and their different aspects and applications.
- CO2:** Get the knowledge about synthetic dyes and their different classification.
- CO3:** Get information about liquid crystals, their classifications and their uses.
- CO4:** Learn about macromolecules and determination of molar masses of macromolecules.

Mapping of CO with PO's and PSO's
Paper No. CHEM-601-I

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO2	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	M	S	S
CO3	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	S	S	S
CO4	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Finar, I. L. *Organic Chemistry (Volume 2)*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Berg, J.M., Tymoczko, J.L. & Stryer, L. *Biochemistry*, W.H. Freeman, 2002.
- Nelson, D. L. & Cox, M. M. *Lehninger's Principles of Biochemistry 7th Ed.*, W. H. Freeman.
- Biochemistry, Voet and Voet.
- Fundamentals of Biochemistry, Jain and Jain, S Chand and company.
- B. R. Puri, Madan S. Pathania , L. R. Sharma *Principles of Physical Chemistry* Vishal Publications.

B. Sc. IIIrd Year (VIth Semester)
Paper-I (CHEM-601-II) Green Chemistry, Organosulphur Compounds and Organic Polymers
(Theory)

Credit : 2

Time : 3 Hrs.

Total Marks =50

(40 EM + 10 IA)

Note: Nine questions will be set. Q.No.1, based on the whole syllabus, is compulsory. There will be four questions from section A and four from section B. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Green chemistry

What is Green Chemistry? Need for Green Chemistry. Goals of Green Chemistry.

Limitations/ Obstacles in the pursuit of the goals of Green Chemistry, Principles of Green Chemistry and Designing a Chemical synthesis, Twelve principles of Green Chemistry with their explanations and examples.

Principles of Green Chemistry and Designing a Chemical synthesis

Twelve principles of Green Chemistry with their explanations and examples and special emphasis on the following: Designing a Green Synthesis using these principles; Prevention of Waste/ byproducts; maximum incorporation of the materials used in the process into the final products , Atom Economy, calculation of atom economy of the rearrangement, addition, substitution and elimination reactions. Prevention/ minimization of hazardous/ toxic products reducing toxicity.

(Function) hazard \times exposure; waste or pollution prevention hierarchy. Green solvents– water as a solvent for organic reactions, ionic liquids, PEG, solvent less processes, immobilized solvents and how to compare greenness of solvents.

Section – B (15 hrs)

Organic Polymers

Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler-Natta polymerization and vinyl polymers. Condensation or step growth polymerization.

Properties of Polymers (Physical, thermal, Flow & Mechanical Properties). Brief introduction to preparation, structure, properties and application of the following polymers: polyolefins, polystyrene and styrene copolymers, poly(vinyl chloride) and related polymers, poly(vinyl acetate) and related polymers, acrylic polymers, fluoro polymers, polyamides and related polymers. Phenol formaldehyde resins (Bakelite, Novalac), polyurethanes, silicone polymers, polydienes, Polycarbonates, Conducting Polymers, [polyacetylene, polyaniline, poly(p-phenylene sulphide polypyrrole, polythiophene)].

Course Outcomes:**CO1:** Know about the principle of green chemistry.**CO2:** To apply the knowledge of green chemistry.**CO3:** To know about basics of organic polymers and their applications.**Mapping of CO with PO's and PSO's****Paper No. CHEM-601-II**

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S 1	P S 2	P S 3	P S 4	P S 5	P S 6	P S 7
CO1	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	S	M	S	S
CO2	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	S	M	S	S
CO3	S	S	S	M	S	M	W	S	W	W	S	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK**Reference Books:**

- Ahluwalia, V.K. & Kidwai, M.R. New Trends in Green Chemistry, Anamalaya Publishers (2005). Anastas, P.T. & Warner, J.K.: Green Chemistry - Theory and Practical, Oxford University Press (1998).
- Matlack, A.S. Introduction to Green Chemistry, Marcel Dekker (2001).
- Cann, M.C. & Connely, M.E. Real-World cases in Green Chemistry, American Chemical Society, Washington (2000).
- Ryan, M.A. & Tinnesand, M. Introduction to Green Chemistry, American Chemical Society, Washington (2002).
- Lancaster, M. Green Chemistry: An Introductory Text RSC Publishing, 2nd Edition, 2010.

B. Sc. IIIrd Year (VIth Semester)
Paper-II (CHEM-602-I) Analytical Chemistry (Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. Q.No.1, based on the whole syllabus, is compulsory. There will be four questions from section A and four from section B. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Analytical chemistry

Introduction to Analytical Chemistry and its interdisciplinary nature. Concept of sampling. Importance of accuracy, precision and sources of error in analytical measurements. Presentation of experimental data and results, from the point of view of significant figures.

Analysis of soil, water and food products

Composition of soil, Concept of pH and pH measurement, Complexometric titrations, Chelation, Chelating agents, use of indicators:

- a. Determination of pH of soil samples.
- b. Estimation of Calcium and Magnesium ions as Calcium carbonate by complexometric titration.

Analysis of water: Definition of pure water, sources responsible for contaminating water, water sampling methods, water purification methods.

- a. Determination of pH, acidity and alkalinity of a water sample.
- b. Determination of dissolved oxygen (DO) of a water sample.

Section – B (15 hrs)

Analysis of food products: Nutritional value of foods, idea about food processing and food preservatives and adulteration.

- a. Identification of adulterants in some common food items like coffee powder, asafoetida, chilli powder, turmeric powder, coriander powder and pulses, etc.
- b. Analysis of preservatives and colouring matter.

Analysis of cosmetics

Major and minor constituents and their function

- a. Analysis of deodorants and antiperspirants, Al, Zn, boric acid, chloride, sulphate.
- b. Determination of constituents of talcum powder: Magnesium oxide, Calcium oxide, Zinc oxide and Calcium carbonate by complexometric titration.

Chromatography

Definition, general introduction on principles of chromatography, paper chromatography, TLC etc.

- a. Paper chromatographic separation of mixture of metal ion (Fe^{3+} and Al^{3+}).

- b. To compare paint samples by TLC method.

Ion-exchange: Column, ion-exchange chromatography etc.

Determination of ion exchange capacity of anion /cation exchange resin (using batch procedure if use of column is not feasible).

Course Outcomes :

CO1: To know about basics of analytical chemistry.

CO2: Aware about analysis of soils, water, cosmetics and food products.

CO3: To explain definition and principle of chromatography.

CO4: Have idea about analysis of cosmetics.

CO5: To know about principles and various types of chromatography techniques.

Mapping of CO with PO's and PSO's

Paper No. CHEM-602-I

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	M	M	S	M	W	S	S	S	S	S	M	S	S
CO2	S	S	S	S	S	S	M	S	M	W	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	M	S	M	W	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	M	S	M	W	S	S	S	M	S	S	S	S
CO5	S	S	S	S	S	S	M	S	W	W	S	S	S	S	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Willard, H.H., Merritt, L.L., Dean, J. & Settle, F.A. *Instrumental Methods of Analysis*. 7th Ed. Wadsworth Publishing Co. Ltd., Belmont, California, USA, 1988.
- Skoog, D.A. Holler F.J. & Nieman, T.A. *Principles of Instrumental Analysis*, Cengage Learning India Ed.
- Skoog, D.A.; West, D.M. & Holler, F.J. *Fundamentals of Analytical*
- *Chemistry* 6th Ed., Saunders College Publishing, Fort Worth (1992).
- Harris, D. C. *Quantitative Chemical Analysis*, W. H. Freeman.
- Dean, J. A. *Analytical Chemistry Notebook*, Mc Graw Hill.

B. Sc. IIIrd Year (VIth Semester)
Paper-II (CHEM-602-II) Nuclear Chemistry, Organosulphur Compounds and Catalysis
(Theory)

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. Q.No.1, based on the whole syllabus, is compulsory. There will be four questions from section A and four from section B. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carries 12 marks and all questions in Section A & B (not more than 2-3 parts) carry 12 marks each.

Section – A (15 hrs)

Nuclear chemistry

Radioactivity, Rays from radioactive materials, radioactive disintegration, half-life period, radioactive equilibrium. Steady state, Theory of radioactivity, Carbon dating.

Nuclear fission, Calculation of energy released in nuclear fission, the fission chain reaction, The concept of critical mass, Nuclear fusion, Nuclear reactions, Radiation chemistry, Radiolysis of water, Nuclear reactor.

Radioactive isotopes, radiochemical principle in the use of tracers, applications of tracers in chemical investigations, physiochemical methods, analytical applications, age determinations, medical applications, agricultural applications.

Section – B (15 hrs)

Organosulfur Compounds

Nomenclature, structural features, Methods of formation and chemical reactions of thiols, thioethers, sulphonic acids, sulphonamides and sulphaguanidine.

Catalysis

General characteristics of catalytic reactions, Acid-base catalysis, Enzyme catalysis, Michaelis-Menten equation, Effect of temperature on enzyme catalysis, Heterogeneous catalysis, Surface reactions, Kinetics of surface reactions, Unimolecular surface reactions, Bimolecular surface reactions, Effect of temperature on surface reactions, Autocatalysis and Oscillatory reactions.

Course Outcomes :

- CO1:** To know the basic concepts of nuclear chemistry and various processes occurs during the nuclear reactions.
- CO2:** Have knowledge about basic of catalysis and their related aspects.
- CO3:** To know about the types of organosulphur compounds and their studies.

Mapping of CO with PO's and PSO's
Paper No. CHEM-602-II

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	M	W	S	M	W	S	S	S	S	S	M	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Willard, H.H., Merritt, L.L., Dean, J. & Settle, F.A. Instrumental Methods of Analysis, 7th Ed. Wadsworth Publishing Co. Ltd., Belmont, California, USA, 1988.
- Skoog, D.A. Holler F.J. & Nieman, T.A. Principles of Instrumental Analysis, Cengage Learning India Ed.
- Skoog, D.A.; West, D.M. & Holler, F.J. Fundamentals of Analytical Chemistry, 6th Ed., Saunders College Publishing, Fort Worth (1992).
- Harris, D. C. Quantitative Chemical Analysis, W. H. Freeman.
- Dean, J. A. Analytical Chemistry Notebook, Mc Graw Hill.

B. Sc. IIIrd Year (VIth Semester)
Paper-III (CHEM-603-I) (Chemistry Practical – VI)

Credit : 2
Time : 6 Hrs.

Total Marks =50
(40 EM + 10 IA)

1. To determine the strength of the given acid solution (mono acid only) conductometrically.
2. To determine the solubility and solubility product of a lead sulphate conductometrically.
3. To determine the strength of a given Mohr's salt solution potentiometrically.
4. To determine the molecular weight of a non-volatile solute by Rast method.
5. Preparation of acidic and basic buffers and comparison of their pH with theoretical values.
6. To determine the specific rotation of an optically active substance (any two).
7. To separate the binary liquid mixtures using distillation.
8. Determination of total reducing sugar (before inversion and after inversion).
9. Synthesis of the following organic compounds:
 - (a) To prepare salicylic acid from Aspirin.
 - (b) To prepare p-bromoaniline from p-bromoacetanilide.
 - (c) To prepare soap from vegetable oil.

Course Outcomes:

CO1: To perform conductometric titrations to find out strength of monobasic acid and also solubility and solubility product of a sparingly soluble salt.

CO2: Able to conduct the potentiometric titrations.

CO3: Can separate the binary liquid mixture using distillation.

CO4: Able to synthesize various organic compounds & soap in the lab.

Mapping of CO with PO's and PSO's

Paper No. CHEM-603 (Practical)

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	S	W	M	M	W	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	W	M	M	W	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	W	M	M	W	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	W	M	M	W	S	S	S	M	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Scheme of Practical Examination

Duration : 6 Hrs. (Two Session of Three Hours)

Distribution of Marks :

- | | | |
|-----------------|---|----------|
| 1. Experiment 1 | = | 12 Marks |
| 2. Experiment 2 | = | 12 Marks |
| 3. Lab. Record | = | 08 Marks |
| 4. Viva-Voce | = | 08 Marks |

B. Sc. IIIrd Year (VIth Semester)
Paper-III (CHEM-603-II) (Chemistry Practical – VI)

Credit : 2
Time : 6 Hrs.

Total Marks =50
(40 EM + 10 IA)

1. To determine the strength of the given acid solution (mono acid only) conductometrically.
2. To determine the solubility and solubility product of a barium sulphate conductometrically.
3. To determine the strength of a given Ferrous ammonium sulphate solution potentiometrically.
4. To determine the molecular weight of a non-volatile solute by Rast method.
5. Preparation of acidic and basic buffers and comparison of their pH with theoretical values.
6. To determine the specific rotation of an optically active substance (any two).
7. Determination of Fructose/glucose ratio in honey sample.
8. Quantitation of protein (Casein) in milk/butter.
9. Synthesis of the following organic compounds:
 - (a) To prepare m-nitroaniline from m-dinitrobenzene.
 - (b) To prepare S-Benzyl-iso-thiuronium chloride from Thiourea.

Course Outcomes:

- CO1:** To perform conductometric titrations to find out strength of monobasic acid and also solubility and solubility product of a sparingly soluble salt.
- CO2:** Able to conduct the potentiometric titrations.
- CO3:** Can separate the binary liquid mixture using distillation.
- CO4:** Able to synthesize various organic compounds in the lab.

Mapping of CO with PO's and PSO's

Paper No. CHEM-603 (Practical)

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	S	W	M	M	W	S	S	S	M	S	S	S	S	S
CO2	S	S	S	S	S	S	W	M	M	W	S	S	S	M	S	S	S	S	S
CO3	S	S	S	S	S	S	W	M	M	W	S	S	S	M	S	S	S	S	S
CO4	S	S	S	S	S	S	W	M	M	W	S	S	S	M	S	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Scheme of Practical Examination

Duration : 6 Hrs. (Two Session of Three Hours)

Distribution of Marks :

- | | | |
|-----------------|---|----------|
| 1. Experiment 1 | = | 12 Marks |
| 2. Experiment 2 | = | 12 Marks |
| 3. Lab. Record | = | 08 Marks |
| 4. Viva-Voce | = | 08 Marks |

B. Sc. IIIrd Year (VIth Semester)
Paper-I (SECC-I) Clinical Chemistry

Credit : 2
Time : 3 Hrs.

Total Marks =50
(40 EM + 10 IA)

Note: Nine questions will be set. Q.No.1, based on the whole syllabus, is compulsory. There will be four questions from section A and four from section B. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carries 12 marks and all questions in Section A & B (not more than 2-3 parts) carry 12 marks each.

Section – A (15 hrs)

Definition, uses and side effects of the following categories of drugs:

Antipyretics, analgesics & anti-inflammatory agents (paracetamol, aspirin, mefenamic acid, ibuprofen and diclofenac); **Anti-tussive and expectorant** (dextromethorphan, bromhexene); **Decongestant** (Theophylline, pseudoephedrine, phenylpropanolamine); **Anti-allergic** (Cetirizine, diphenhydramine); **Antiasthmatic** (prednisone, budesonide); **Antibacterial drugs** (ampicillin, amoxycillin, doxycycline, cephalexin, ciprofloxacin); **antimalarial** (Chloroquine, chloroquine), **Anti-amoebic** (Metronidazole, tinidazole); **Anthelmintic and anti-parasitic** (Mebendazole, Albendazole); **Anticancer** (Chlorambucil, cyclophosphamide), **Antihypertensive** (amlodipine, atenolol); **Cardiovascular drugs** (sorbitrate, diltiazem).

Section – B (15 hrs)

Common clinical chemistry tests: Normal range and significance of following clinical tests

Electrolytes (Sodium, Potassium, Chloride), **Renal (Kidney) Function Tests** (Creatinine, Blood urea nitrogen), **Liver Function Tests** (Total protein (serum), Bilirubin; direct; indirect; total), **Cardiac Markers, Minerals** (Calcium, Magnesium, Phosphate, Potassium), **Blood Disorders** (Iron, Vitamin B12, Vitamin D, Folic acid), **Miscellaneous** (Glucose, Glycosylated hemoglobin, Uric acid)

Nutritional Chemistry: Fat soluble and water soluble vitamins (Sources, recommended levels and deficiency diseases; vitamin A, vitamin B₁, vitamin B₂, vitamin B₃, vitamin B₅, vitamin B₆, vitamin B₇, vitamin B₉, vitamin B₁₂, vitamin C, vitamin D, vitamin E, and vitamin K),

Reference Daily Intake and Roles in biological processes of following essential dietary minerals (Major minerals- calcium, phosphorus, potassium, sodium, and magnesium; Trace elements-sulfur, iron, chlorine, cobalt, copper, molybdenum, iodine, and selenium).

Course Outcomes :

CO1: To have a knowledge about different categories of drugs their uses and side effects.

CO2: To know sources, recommended levels and deficiency diseases of fat soluble and water soluble vitamins.

CO3: To get knowledge Reference Daily Intake and Roles in biological processes of following essential dietary minerals.

Mapping of CO with PO's and PSO's
Paper No. SECC-I

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- Medicinal chemistry by Ashutosh Kar
- Medicinal chemistry by D. Sriram and P. Yogeeshwari.
- Berdanier, Carolyn D.; Dwyer, Johanna T.; Heber, David. Handbook of Nutrition and Food, Third Edition. CRC Press.
- The vitamins: fundamental aspects of nutrition and health; G. F. Combs Jr. and G.F. combs Sr, Academic press.

B. Sc. IIIrd Year (VIth Semester)

Paper-I (SECC-II) Chemistry Lab- Maintenance and Handling

Credit : 2

Time : 3 Hrs.

Total Marks =50

(40 EM + 10 IA)

Note: Nine questions will be set. Q.No.1, based on the whole syllabus, is compulsory. There will be four questions from section A and four from section B. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no.1 carry 8 marks and all questions in Section A & B (not more than 2-3 parts) carry 8 marks each.

Section – A (15 hrs)

Familiarization with chemical labeling, Handling of hazardous chemicals, Handling of glassware.

Sodium metal disposal, Familiarization with chemical concepts related to solution preparation and standardization: Equivalent mass, molar mass, specific gravity, concentration (Normality, Molarity, Molality, % w/v, % w/w, % v/v, ppm, ppb solutions), Basicity, acidity, solutions of oxidizing and reducing agents. Determination of concentration and percentage purity. Standardization of solutions, Knowledge about primary and secondary standards.

Knowledge about indicators and preparation of indicator solutions, Knowledge about buffers and preparation of buffer solutions, Preparation of complexometric solutions (e.g. EDTA solutions) and titrations, Management of chemical waste.

Section – B (15 hrs)

Purification of chemicals through distillation, crystallization, sublimation etc. Operating knowledge including calibration, handling and maintenance of Potentiometers. Knowledge about different electrodes (e.g. Ag, Pt, SCE, Ag/AgCl) and their upkeep, Operating knowledge including calibration and maintenance of pH-meters and glass electrode, Operating knowledge including calibration and maintenance of refractometer, polarimeter, Operating knowledge including calibration and maintenance of conductometer, Operating knowledge including calibration and maintenance of Flame-photometer, Spectrophotometer, Interferometer, Dipole meter.

Course Outcomes:

- CO1:** Have basic knowledge about chemicals and instruments present in the chemistry lab and also their handling and maintenance.
- CO2:** Able to know about different concept of preparations of solution, indicators and buffer solutions in chemistry lab.
- CO3:** To know about various methods for the purification of various chemicals used in the lab.
- CO4:** Have knowledge about the calibration, handling and maintenance of various instruments used in the chemistry laboratory.

Mapping of CO with PO's and PSO's
Paper No. SECC-II

<i>Course Outcome</i>	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7
CO1	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	W	S	M	W	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	W	S	M	W	S	S	S	M	S	S	S	S

S= STRONG, M= MEDIUM, W= WEAK

Reference Books:

- A text book of qualitative analysis by A.I. Vogel.
- A text book of quantitative analysis by A. I. Vogel.

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)



DEPARTMENT OF GEOGRAPHY

CBCS CURRICULUM (2020 -21)
Program Name: B.A. Geography
(For the Batches Admitted From 2020-2021)

OUTCOME BASED EDUCATION SYSTEM

CBCS CURRICULUM (2020-21)
Program Name: B. A. Geography
(For the Batches Admitted From 2020-2021)

VISION

Be globally acknowledged as a distinguished centre of academic excellence.

MISSION

To prepare a class of proficient scholars and professionals with ingrained human values and commitment to expand the frontiers of knowledge for the advancement of society.

DEPARTMENT VISION AND MISSION

VISION

- To become a model department as a Centre of quality education, research with innovation and recognition at National and International level for serving the society.

MISSION

- **M1:** To provide quality education to aspiring young minds for improving their skills, inculcating values, creating leadership qualities and enhance research with innovative methods.
- **M2:** To produce young geographers who would contribute in the areas of higher education, regional and national planning, development, environment, ethics and sustainable environment development.
- **M3:** To develop Teaching-Learning methods which can produce socially committed professionals who contribute effectively in nation building.

Mapping of University Vision and Mission to Department Vision and Mission

Acclaimed as modal Centre of Learning and Research by

University Vision and Mission	Department Vision and Mission
High quality knowledge delivery through state of art infrastructure and ethical values to the students	Yes
Students excellence will make them professionals and innovators emerging as national and global leaders	Yes
Research and development will help in furtherance of faculty knowledge	Yes

Program Outcomes (PO) with Graduate Attributes

Programme outcomes are attributes of the graduates from the programme that are indicative of the graduates' ability and competence to work after being a qualified professional geographer upon graduation. Program outcomes are statements that describe what students are expected to know or do by the time of graduation, they must relate to knowledge and skills that the students acquire from the programme. The achievement of all outcomes indicates that the student is well prepared to achieve the program educational objectives down the road. The department of geography has the following eleven PO's. The course syllabi and the overall curriculum have been designed to achieve these outcomes:

Program Outcomes (PO) for Under Graduate Programmes (CBCS) in the Faculty of Sciences, Kurukshetra University, Kurukshetra

PO1	Knowledge	Capable of demonstrating comprehensive disciplinary knowledge gained during course of study
PO2	Communication	Ability to communicate effectively on general and scientific topics with the scientific community and with society at large
PO3	Problem Solving	Capability of applying knowledge to solve scientific and other problems
PO4	Individual and Team Work	Capable to learn and work effectively as an individual, and as a member or leader in diverse teams, in multidisciplinary settings.
PO5	Investigation of Problems	Ability of critical thinking, analytical reasoning and research-based knowledge including design of experiments, analysis and interpretation of data to provide conclusions
PO6	Modern Tool usage	Ability to use and learn techniques, skills and modern tools for scientific practices
PO7	Science and Society	Ability to apply reasoning to assess the different issues related to society and the consequent responsibilities relevant to the professional scientific practices
PO8	Life-Long Learning	Aptitude to apply knowledge and skills that are necessary for participating in learning activities throughout the life
PO9	Environment and Sustainability	Ability to design and develop modern systems which are environmentally sensitive and to understand the importance of sustainable development.
PO10	Ethics	Apply ethical principles and professional responsibilities in scientific practices
PO11	Project Management	Ability to demonstrate knowledge and understanding of the scientific principles and apply these to manage projects

Program Specific Outcomes (PSO's):

- **PSO1:** Basic understanding of fundamental concepts of geography as an earth science.
- **PSO2:** Clearly formulate and solve real life challenges with respect to human environment interactions.
- **PSO3:** Applications of fundamental principles of geography for the betterment of human society.
- **PSO4:** Acquisition of skills to effectively communicate the knowledge of geography to the society for safe guarding the physical environment.

Kurukshetra University Kurukshetra
Scheme of Examinations and Syllabus for B.A
under Choice Based Credit System w.e.f. 2020-21 in phased manner
Subject: Geography

Semester	Course	Course Code	Nomenclature of the Paper	Credits	Hours/ week	Marks			Duration of Exam.	
						Ext.	Int.	Total		
I	Core Course (CC)-I (Geography)	B-GEO-101	Geography of India	3	3	60	15	75	3 Hours	
		B-GEO-102	Geography of Haryana	3	3	60	15	75	3 Hours	
		B-GEO-103	Maps and scales (Practical)	2	4	40	10	50	3 Hours	
II	Core Course (CC)-II (Geography)	B-GEO-201	Physical Geography- I	3	3	60	15	75	3 Hours	
		B-GEO-202	Human Geography- I	3	3	60	15	75	3 Hours	
		B-GEO-203	Representation of Physical Features (Practical)	2	4	40	10	50	3 Hours	
III	Core Course (CC)-III (Geography)	B-GEO-301	Physical Geography-II	3	3	60	15	75	3 Hours	
		B-GEO-302	Human Geography -II	3	3	60	15	75	3 Hours	
		B-GEO-303	Representation of Climatic Data (Practical)	2	4	40	10	50	3 Hours	
IV	Core Course (CC)-IV(Geography)	B-GEO-401	Economic Geography	3	3	60	15	75	3 Hours	
		B-GEO-402	Statistical methods in Geography	3	3	60	15	75	3 Hours	
		B-GEO-403	Maps and Diagrams (Practical)	2	4	40	10	50	3 Hours	
	Skill Enhancement Course (SEC) (Geography)	B-GEO-SEC-404	Map Reading and Interpretation	2	2	40	10	50	2½ Hours	
		OR							2½ Hours	
		B-GEO-SEC-405	Reading and Interpretation of Digital Maps						2½ Hours	
V	Discipline Specific Elective (DSE)- A(Geography)	B-GEO-DSE-501	Agricultural Geography	2	2	40	10	50	2½ Hours	
		OR							2½ Hours	
		B-GEO-DSE-502	Resource Geography						2½ Hours	
		B-GEO-DSE-503	Settlement Geography	2	2	40	10	50	2½ Hours	
		OR							2½ Hours	
		B-GEO-DSE-504	Transport Geography						2½ Hours	
		B-GEO-DSE-505	Map Projections (Practical)	2	4	40	10	50	3 Hours	
		OR								
		B-GEO-DSE-506	Socio-economic Field Survey (Practical)						3 Hours	
	OR									
	B-GEO-DSE-507	*MOOC course from Swayam Portal	**	**			**			
	Generic Elective (GE)-A (Geography)	B-GEO-GE-508	India: General Geography	4	4	80	20	100	3 Hours	
		B-GEO-GE-509	India: General Geography (Practical)	2	4	40	10	50	3 Hours	
VI	Discipline Specific Elective (DSE)-B (Geography)	B-GEO-DSE-601	Fundamentals of Remote Sensing	2	2	40	10	50	2½ Hours	
		OR								
		B-GEO-DSE-602	Introduction to Geo-spatial Technology						2½ Hours	
		B-GEO-DSE-603	Geography of Asia	2	2	40	10	50	2½ Hours	
		OR								
		B-GEO-DSE-604	Geography of Europe						2½ Hours	
		B-GEO-DSE-605	Elementary Remote Sensing (Practical)	2	4	40	10	50	3 Hours	
		OR							3 Hours	
	B-GEO-DSE-606	Physical Field Survey (Practical)								
	Generic Elective (GE)-B (Geography)	B-GEO-GE-607	World: General Geography	4	4	80	20	100	3 Hours	
		B-GEO-GE-608	World: General Geography (Practical)	2	4	40	10	50	3 Hours	
Total			46	58	920	230	1150			

Note: Ext. = External Assessment Marks
Ent. = Internal Assessment Marks

Semester-I
Core Course Code: B-GEO-101
Core Course Name: Geography of India

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course Outcomes (COs):

- B-GEO-101.1:** Provides understanding about the physical structure of India.
B-GEO-101.2: Enrichment of understanding about the human resource endowment.
B-GEO-101.3: Acquaintance with geographical distribution of major resources.
B-GEO-101.4: Enhancement of knowledge about spatial distribution of industries, transport and communication.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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- I

1. Introduction: location, relief structure and drainage systems.
2. Bio-climatic environment: Climate, soils and natural vegetation.

UNIT-II

3. Population: distribution, density and growth.
4. Human habitats: types of human settlements and levels of urbanization.

UNIT-III

5. Agriculture: land resources, irrigation, cropping pattern and Green Revolution
6. Energy and mineral resources: coal, petroleum, hydropower, iron ore, manganese and mica.

UNIT-IV

7. Industries: iron and steel, cotton textile, sugar and industrial regions of India.
8. Transport and trade: modes of transport, international trade.

Suggested Readings:

1. Deshpande, C D: India-A Regional Interpretation, Northern Book Depot, New Delhi, 1992.
2. Hussain Majid (2015): Geography of India, Mc Graw Hill Education.
3. Singh, Gopal: Geography of India, Atma Ram and Sons, 2006.
4. Shafi, M: Geography of South Asia, McMillan and Company, Calcutta, 2000.
5. Singh, R L (ed): India: A Regional Geography, National Geographical Society, India, Varanasi, 1971.
6. Spate, O H K and ATA Learmonth: Indian and Pakistan-Land, People and Economy, Methuen and Company, London, 1967.

Mapping of Course Outcomes to Program Outcomes (Geography of India)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-101.1	3.0	3.0	1.0	1.0	2.0	1.0	2.0	3.0	3.0	1.0	2.0
B-GEO-101.2	3.0	3.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	3.0
B-GEO-101.3	3.0	2.0	2.0	1.0	3.0	1.0	2.0	3.0	3.0	1.0	2.0
B-GEO-101.4	3.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	2.0	1.0	2.0
Average	3.0	2.5	1.8	1.5	2.5	1.3	2.5	3.0	2.8	1.3	2.3

Mapping of Course Outcomes to Program Specific Outcomes (Geography of India)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-101.1	3.0	2.0	3.0	2.0
B-GEO-101.2	3.0	3.0	3.0	3.0
B-GEO-101.3	3.0	2.0	3.0	2.0
B-GEO-101.4	3.0	3.0	3.0	2.0
Average	3.0	2.5	3.0	2.5

Semester-I
Core Course Code: B-GEO-102
Core Course Name: Geography of Haryana

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-102.1:** Provide understanding about the bio physical environment of Haryana.
B-GEO-102.1: Enhancement of knowledge about population distribution and agricultural pattern.
B-GEO-102.1: Enrichment of knowledge about spatial distribution of industries, transport and communication.
B-GEO-102.1: Acquaintance with regional diversities and structure.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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- I

1. Introduction: administrative divisions, geographical personality and relief.
2. Bio physical environment: drainage, climate, soils and vegetation.

UNIT- II

3. Population: distribution, density, growth and settlements.
4. Agriculture: land use and cropping pattern, irrigation and problems of agriculture.

UNIT-III

5. Industry: distribution and pattern of major industries and industrial regions.
6. Transportation: modes of transportation and communication.

UNIT-IV

7. Geographical regions: Ahirwal, Mewat, Khadar and Bagar.
8. Regional diversities: environmental, economic and socio-cultural diversities.

Suggested Readings:

1. Census of India. 1981. Regional Division in Haryana.
2. Census of India. 2001. Administrative Atlas of Haryana.
3. Chaudhary, D.R. 2009. Haryana at Crossroads: problems and prospects. National Book Trust of India, New Delhi.
4. Singh, J. 1976. Agricultural Geography of Haryana, Vishal Publication, Kurukshetra.
5. Singh, R.L. 1971. India- A Regional Geography. National Geographical Society of India, Varanasi.
6. Verma, D.C. and Singh, S. 2001. Haryana-The Land and People. National Book Trust of India, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Geography of Haryana)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-102.1	3.0	3.0	2.0	1.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-102.2	3.0	3.0	3.0	2.0	3.0	2.0	2.0	3.0	3.0	1.0	2.0
B-GEO-102.3	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	1.0	3.0
B-GEO-102.4	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
Average	3.0	3.0	2.5	1.8	3.0	1.8	2.5	3.0	2.8	1.5	2.5

Mapping of Course Outcomes to Program Specific Outcomes (Geography of Haryana)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-102.1	3.0	3.0	2.0	3.0
B-GEO-102.2	3.0	3.0	2.0	2.0
B-GEO-102.3	3.0	3.0	3.0	2.0
B-GEO-102.4	3.0	3.0	3.0	3.0
Average	3.0	3.0	2.5	2.5

Semester-I
Core Course Code: B-GEO-103
Core Course Name: Maps and Scales (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-103.1:** Knowledge about cartographic skills.
B-GEO-103.2: Provides understanding about map scales.
B-GEO-103.3: Measurement skills of distances and areas on maps.
B-GEO-103.4: Enhancement of knowledge about enlargement and reduction of maps.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise = 24 File Record = 08 Viva-voce = 08

1. Introduction to Cartography.
2. Maps and their types.
3. Map Scales.
 - (i) Methods of Expressing a scale 2 exercise
 - (ii) Conversion of Statement of Scale into R.F. and vice-versa. 1 exercise
 - (iii) Plain Scale (km and mile) 1 exercise
 - (iv) Comparative Scale 2 exercise
 - (v) Diagonal Scale 2 exercise
4. Measurement of Distances and Areas on Maps 2 exercise
5. Enlargement and Reduction of Maps 2 exercise

Suggested Readings:

1. F.J. Monkhouse and H.R. Wilkinson (1972) Maps and Diagrams, Methuen and Co. Ltd., London
2. L.R. Singh and Raghuvander Singh (1973), Map Work and Practical Geography, Central Book Depot, Allahabad.
3. R.L. Singh and P.K. Dutt (1968), Elements of Practical Geography, Students Friends, Allahabad.
4. Singh Gopal (2004). Map Work and Practical Geography, Vikas Publication House.

Mapping of Course Outcomes to Program Outcomes (Maps and Scales-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-103.1	3.0	1.0	1.0	1.0	1.0	2.0	1.0	3.0	1.0	1.0	1.0
B-GEO-103.2	3.0	2.0	1.0	1.0	2.0	3.0	2.0	3.0	1.0	1.0	2.0
B-GEO-103.3	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	1.0	1.0	3.0
B-GEO-103.4	3.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	1.0	2.0	3.0
Average	3.0	2.0	1.5	1.5	2.3	2.8	2.0	3.0	1.0	1.3	2.3

Mapping of Course Outcomes to Program Specific Outcomes (Maps and Scales-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-103.1	3.0	1.0	2.0	1.0
B-GEO-103.2	3.0	1.0	3.0	2.0
B-GEO-103.3	3.0	2.0	3.0	2.0
B-GEO-103.4	3.0	3.0	3.0	3.0
Average	3.0	1.8	2.8	2.0

Semester-II
Core Course Code: B-GEO-201
Core Course Name: Physical Geography-I

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-201.1:** Provides knowledge about the basics of physical geography
B-GEO-201.2: Enrichment of knowledge about tectonic activities.
B-GEO-201.3: Enhancement of knowledge about processes controlling weathering and mass movement
B-GEO-201.4: Provides ability to understand the processes and patterns of erosion.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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-I

1. Definition, nature, scope and fields of physical geography.
2. Interior of the earth, geological time scale and rocks.

UNIT-II

3. Earth movements; earth quakes and volcanoes.
4. Wegner's theory of continental drift and Plate tectonic theory.

UNIT-III

5. Weathering; causes and its types.
6. Mass-movements; causes, its types and impacts.

UNIT-IV

7. Concept of cycle of erosion
8. Landforms: wind, river, underground water and glaciers

Suggested Readings:

1. Bloom A.L. 1998. Geomorphology-A Systematic Analysis of Late Cenozoic Landforms. Prentice Hall of India, New Delhi, India.
2. Sharma H.S. Perspective in Geomorphology, Concept, New Delhi 1980.
3. Singh Savinder, Geomorphology, Prayag Publication, Allahabad 1998.
4. Singh Savinder, Physical Geography Prayag Publication, Allahabad, 1998.
5. Sparks B.W. Geomorphology, Longman, London, 1960.
6. Thornbury W.D. 1969 Principles of Geomorphology, New York, John Wiley & Sons.

Mapping of Course Outcomes to Program Outcomes (Physical Geography-I)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-201.1	3.0	2.0	2.0	1.0	3.0	2.0	2.0	3.0	3.0	1.0	1.0
B-GEO-201.2	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0
B-GEO-201.3	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0
B-GEO-201.4	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0
Average	3.0	2.8	2.8	2.3	3.0	2.3	2.8	3.0	3.0	1.8	2.5

Mapping of Course Outcomes to Program Specific Outcomes(Physical Geography-I)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-201.1	3.0	2.0	1.0	1.0
B-GEO-201.2	3.0	3.0	3.0	3.0
B-GEO-201.3	3.0	3.0	3.0	3.0
B-GEO-201.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.5	2.5

Semester-II
Core Course Code: B-GEO-202
Core Course Name: Human Geography-I

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-202.1:** Provides knowledge about the fundamentals of human geography.
B-GEO-202.2: Enrichment of knowledge about distribution of races and tribes in the world.
B-GEO-202.3: Acquaint with religions and their distribution in the world.
B-GEO-202.4: Familiarization with different languages of the world and their geographical distribution.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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-I

1. Nature and scope of human geography, branches of human geography,
2. Human-environment relationship: environmental determinism, possibilism and ecological approach

UNIT – II

3. Human race: Meaning, classification of races and their global diffusion and distribution.
4. Tribe: Definition, classification and global distribution; environmental adaptation by Eskimo, Bushman, Gonds and Gujjars.

UNIT – III

5. Religion: Meaning, nature, classification and evolution.
6. Geographical distribution of religions: Christianity, Islam, Hinduism, Buddhism and Judaism.

UNIT-IV

7. Language and dialects: nature and classification of world languages.
8. Global distribution of major languages: English, Latin, Arabic, Mandarin and Hindi.

Suggested Readings:

1. Agarwal, A et al: The Citizen's Fifth Citizen's Report, Centre for Science & Environment, New Delhi, 1999.
2. Alexander, John. W.: Economic Geography, Prentice Hall of India Ltd., New Delhi, 1988.
3. Bergwan, Edward E: Human Geography: Culture Connections and Landscape, Prentice-Hall, New Jersey, 1985.
4. Carr, M. Patterns: Process and Change in Human Geography, McMillan Education, London, 1987.
5. Chandna, R.C.: A Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi, 1986.
6. DeBlij, H. J.: Human Geography, Culture, Society and Space, John Wiley, New York, 1996.
7. Fellman, J.L.: Human Geography-Landscapes of Human Activities, Brown and Benchman Pub., USA, 1997.
8. Hussain, M. Human Geography, Rawat, Publication, Jaipur, 2018.
9. McBride, P.J.: Human Geography; Systems Patterns and Change, Nelson, UK and Canada, 1996.
10. Michael, C.: New Patterns: Process and Change in Human Geography, Nelson, 1996.
11. Singh, N.A Text Book of Human Geography, Rajesh Publishing, 2015.
12. Sharma, Y.K. Human geography, Narain publishers, 2017.

Mapping of Course Outcomes to Program Outcomes (Human Geography-I)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-202.1	3.0	2.0	1.0	1.0	2.0	1.0	1.0	3.0	2.0	1.0	1.0
B-GEO-202.2	3.0	3.0	2.0	1.0	3.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-202.3	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-202.4	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	2.0	2.0
Average	3.0	2.8	1.8	1.5	2.8	1.0	1.5	3.0	2.0	1.8	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Human Geography-I)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-202.1	3.0	2.0	2.0	1.0
B-GEO-202.2	3.0	2.0	3.0	3.0
B-GEO-202.3	3.0	2.0	3.0	3.0
B-GEO-202.4	3.0	2.0	3.0	3.0
Average	3.0	2.0	2.8	2.5

Semester-II
Core Course Code: B-GEO-203
Core Course Name: Representation of Physical Features (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-203.1:** Knowledge about different types of topographical maps.
B-GEO-203.2: Provides understanding about methods of relief representation.
B-GEO-203.3: Enhancement of skills of relief representation.
B-GEO-203.4: Knowledge of drawing of landform profiles.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise	= 24	File Record	= 08	Viva-voce	= 08
1.	Introduction to Topographical Sheets India and adjacent countries Degree Sheet Half Degree Sheet Quarter Degree Sheet Conventional Signs			3 exercise	
2.	Methods of representing relief			1 exercise	
3.	Representation of Topographical features by contours. Slopes (Concave, convex, undulating and terraced) Valleys (V Shaped, U shaped, Gorge, Re-entrant) Ridges (Conical hill, Volcanic hill, Plateau, Escarpment) Complex features (waterfall, sea cliff, overhanging cliff, Fiord coast)			4 exercise	
4.	Drawing of Profiles (a) Cross Profiles: Serial, superimposed, projected and composite profiles. (b) Longitudinal profiles			5 exercise	

Suggested Readings:

1. F.J. Monkhouse and H.R. Wilkinson (1972) Maps and Diagrams, Methuen and Co. Ltd., London
2. L.R. Singh and Raghuvander Singh (1973), Map Work and Practical Geography, Central Book Depot, Allahabad.
3. R.L. Singh and P.K. Dutt (1968), Elements of Practical Geography, Students Friends, Allahabad.
4. Singh Gopal (2004), Map Work and Practical Geography, Vikas Publication House.

Mapping of Course Outcomes to Program Outcomes (Representation of Physical Features-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-203.1	3.0	2.0	1.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0
B-GEO-203.2	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0
B-GEO-203.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0
B-GEO-203.4	3.0	2.0	3.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0
Average	3.0	2.5	2.5	2.5	2.8	2.3	2.3	3.0	1.8	2.0	3.0

Mapping of Course Outcomes to Program Specific Outcomes (Representation of Physical Features-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-203.1	3.0	2.0	3.0	3.0
B-GEO-203.2	3.0	3.0	3.0	3.0
B-GEO-203.3	3.0	3.0	3.0	3.0
B-GEO-203.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	3.0	3.0

Semester-III
Core Course Code: B-GEO-301
Core Course Name: Physical Geography-II

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-301.1:** Provides knowledge about the basics of climatology and oceanography.
B-GEO-301.2: Enrichment of knowledge about atmospheric circulation and humidity.
B-GEO-301.3: Augmentation of knowledge about weather disturbances.
B-GEO-301.4: Familiarization with the oceanic floor and circulation.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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-I

1. Weather and Climate; composition and structure of atmosphere.
2. Global heat budget and distribution of temperature.

UNIT-II

3. Atmospheric pressure: distribution, pressure belts, planetary winds and monsoon.
4. Humidity: measurement and variables, processes of evaporation, condensation and precipitation.

UNIT-III

5. Air masses and fronts: classification, types and their characteristics.
6. Weather disturbances: tropical and extra-tropical cyclones.

UNIT-IV

7. Oceanic relief: Pacific, Atlantic and Indian Oceans.
8. Distribution of salinity and oceanic circulation (tides and currents)

Suggested Readings:

1. Barry, RG and Chorley R.J., Atmosphere, Weather and Climate, Routledge, 1998.
2. Critchfield, H., General Climatology, Prentice-Hall of India, 2002.
3. King, C. Oceanography for Geographers, Edward Arnold, London, 1975.
4. Trewartha, GT: An Introduction to Climate, Mc-Graw Hill, New York, 1981.
5. Trewartha, G.T., The Earth's Problems Climates, University of Wisconsin Press, USA.

Mapping of Course Outcomes to Program Outcomes (Physical Geography-II)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-301.1	3.0	3.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-301.2	3.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-301.3	3.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-301.4	3.0	3.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0
Average	3.0	3.0	2.0	2.0	1.5	1.0	2.0	3.0	2.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Physical Geography-II)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-301.1	3.0	1.0	1.0	3.0
B-GEO-301.2	3.0	1.0	1.0	3.0
B-GEO-301.3	3.0	1.0	1.0	3.0
B-GEO-301.4	3.0	1.0	1.0	3.0
Average	3.0	1.0	1.0	3.0

Semester-III
Core Course Code: B-GEO-302
Core Course Name: Human Geography-II

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-302.1:** Provides awareness about the population distribution and density.
B-GEO-302.2: Augmentation of knowledge about the growth, fertility and mortality rates.
B-GEO-302.3: Familiarization with age and sex composition of population and literacy rates
B-GEO-302.4: Development of ability to understand the process of urbanization and its impacts.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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- I

1. Distribution and determinants of world population
2. Density of population: meaning, types, world pattern and temporal change.

UNIT- II

3. Growth rate of population: world pattern and trends.
4. Fertility and mortality rates: world pattern and determinants

UNIT- III

5. Age and sex composition of world population; comparison of developed and developing countries.
6. Literacy: Definition, world pattern of literacy rate, its determinants and impacts.

UNIT- IV

7. Urban settlements: origin, classification and functions of towns.
8. Urbanization pattern in the world; determinants and impacts of urbanization.

Suggested Readings:

1. Agarwal, A et al: The Citizen's Fifth Citizen's Report, Centre for Science & Environment, New Delhi, 1999.
2. Alexander, John. W.: Economic Geography, Prentice Hall of India Ltd., New Delhi, 1988.
3. Bergwan, Edward E: Human Geography: Culture Connections and Landscape, Prentice-Hall, New Jersey, 1985.
4. Carr, M. Patterns: Process and Change in Human Geography, McMillan Education, London, 1987.
5. Carter, H.: The study of Urban Geography, Edward Arnold, London, 1972.
6. Chandna, R.C.: A Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi, 2016.
7. DeBlij, H. J.: Human Geography, Culture, Society and Space, John Wiley, New York, 1996.
8. Fellman, J.L.: Human Geography-Landscapes of Human Activities, Brown and Benchman Pub., USA, 1997.
9. Hassan, I: Population Geography: A Systematic Exposition, Routledge, London.
10. McBride, P.J.: Human Geography; Systems Patterns and Change, Nelson, UK and Canada, 1996.
11. Michael, C.: New Patterns: Process and Change in Human Geography, Nelson, 1996.
12. Qazi, S.A.: Population Geography, APH publishers, 2010.
13. Ramachandra, R.: Urbanization and Urban System in India, Oxford, London, 1992.

Mapping of Course Outcomes to Program Outcomes (Human Geography-II)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-302.1	3.0	3.0	2.0	3.0	1.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-302.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0
B-GEO-302.3	3.0	2.0	2.0	3.0	2.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-302.4	3.0	3.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	2.0	2.0
Average	3.0	2.8	2.3	2.8	1.8	1.5	2.3	3.0	2.0	2.0	2.3

Mapping of Course Outcomes to Program Specific Outcomes (Human Geography-II)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-302.1	3.0	3.0	3.0	3.0
B-GEO-302.2	3.0	3.0	3.0	3.0
B-GEO-302.3	3.0	3.0	3.0	3.0
B-GEO-302.4	3.0	3.0	3.0	3.0
Average	3.0	3.0	3.0	3.0

Semester-III
Core Course Code: B-GEO-303
Core Course Name: Representation of Climatic Data (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-303.1:** Capability of measurement of climatic data.
B-GEO-303.2: Ability to represent the temperature and rainfall data.
B-GEO-303.3: Development of skill to read and interpret the weather maps.
B-GEO-303.4: Acquaintance with skills of chain and tape survey.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise	= 24	File Record	= 08	Viva-voce	= 08
1. Measurement of temperature, rainfall, pressure and humidity.					
2. Representation of temperature and rainfall.					
(i) Line and Bar Graph				1 exercise	
(ii) Distribution of temperature				1 exercise	
(iii) Distribution of rainfall				1 Exercise.	
(iv) Hythergraph				1 exercise.	
(v) Rainfall deviation diagram				1 exercise.	
3. Climograph (wet and dry places)				2 exercise.	
4. Distribution of pressure				2 Exercise.	
5. Weather map Interpretation (January & July)				2 exercise.	
6. Chain and tape survey				2 Exercise.	

Suggested Readings

- Khan, A.A. 1996. Text Book of Practical Geography, Concept, New Delhi.
- Lawrence, GRP. 1968. Cartographic Methods, Methuen, London.
- Monkhouse, F.J. and Wilkinson, H.R. 1994. Maps and Diagrams, Methuen, London.
- Mishra R.P. and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
- Robinson, A.H. et.al. Elements of Cartography, John Wiley & Sons, 1995.
- Singh, R.L., 1979. Elements of Practical Geography, Kalyani Publisher, New Delhi.
- Sarkar, A.K 1997: Practical Geography-A Systematic Approach, Orient Longman, Calcutta.

Mapping of Course Outcomes to Program Outcomes (Representation of Climatic Data-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-303.1	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
B-GEO-303.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
B-GEO-303.3	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
B-GEO-303.4	3.0	2.0	1.0	3.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0
Average	3.0	2.8	2.0	2.3	1.8	2.0	1.8	2.5	1.8	1.8	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Representation of Climatic Data-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-303.1	3.0	2.0	2.0	3.0
B-GEO-303.2	3.0	3.0	3.0	3.0
B-GEO-303.3	3.0	3.0	3.0	3.0
B-GEO-303.4	2.0	2.0	2.0	2.0
Average	2.8	2.5	2.5	2.8

Semester-IV
Core Course Code: B-GEO-401
Core Course Name: Economic Geography

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-401.1:** Provides knowledge about the fundamental concepts of economic geography.
B-GEO-401.2: Acquisition of knowledge about resources and their conservation.
B-GEO-401.3: Enrichment of knowledge about distribution of crops, minerals and energy resources.
B-GEO-401.4: Acquaintance with global industries, transport, communication and trade.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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- I

1. Nature and scope of economic geography and its relationship with economics.
2. Classification of economic activities and their impact on environment.

UNIT- II

3. Natural resources: types, bases of classification.
4. Utilization and conservation of natural resources.

UNIT- III

5. World distribution of food crops (rice and wheat), commercial crops (cotton and sugarcane) and plantation crops (tea and coffee).
6. World distribution and production of coal, petroleum and natural gas, iron ore and bauxite

UNIT- IV

7. World distribution and production of iron and steel industry, textile industry, sugar industry and automobile industry.
8. Transport, communication and trade: geographical factors in their development, major modes of water, land and air transport, recent trends in international trade.

Suggested Readings:

1. Gautam, A. 2010. Advanced Economic Geography. Sharda Pustak Bhawan, Allahabad.
2. Hartshorne, T. A. and Alexander, J. W. 2001. Economic Geography. Prentice Hall of India. New Delhi.
3. Hudson, R. 2005. Economic Geography. Sage Publication, New Delhi.
4. Jones, C. F. and Drakenwarld, G. G. Economic Geography. The Macmillan and Company. New York.
5. Knowled, R. and Wareing, J. 1992. Economic and Social Geography. Rupa and Company, Calcutta.
6. Knox, P. 2003. The Geography of World Economy. Arnold, London.
7. Saxena, H.M. 2013. Economic Geography. Rawat Publications, Jaipur.
8. Thomas, RS. 1962. The Geography of Economic Activities. McGraw Hill, New York.
9. Wheeler, J.O. and Muller, P.O. 1995. Economic Geography. John Wiley and Sons. New York.

Mapping of Course Outcomes to Program Outcomes (Economic Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-401.1	3.0	2.0	1.0	1.0	1.0	1.0	1.0	3.0	2.0	2.0	2.0
B-GEO-401.2	3.0	3.0	3.0	2.0	1.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-401.3	3.0	2.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-401.4	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
Average	3.0	2.5	2.0	1.8	1.5	1.3	1.8	3.0	2.0	2.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Economic Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-401.1	2.0	1.0	2.0	1.0
B-GEO-401.2	3.0	3.0	3.0	3.0
B-GEO-401.3	3.0	2.0	3.0	3.0
B-GEO-401.4	3.0	2.0	3.0	3.0
Average	2.8	2.0	2.8	2.5

Semester-IV
Core Course Code: B-GEO-402
Core Course Name: Statistical Methods in Geography

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-402.1:** Development of capability to understand the basics of statistics.
B-GEO-402.2: Capability to comprehend the methods of central tendencies and dispersion.
B-GEO-402.3: Awareness about various tools of inequality analysis.
B-GEO-402.4: Understanding the use of bivariate analysis in geography.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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- I

1. Descriptive statistics: visual descriptive methods, histograms, frequency curve.
2. Measures of central tendency and partition values.

UNIT-II

3. Measure of dispersion: quartile deviation, mean deviation and standard deviation.
4. Probability distribution and normal curve.

UNIT-III

5. Sampling: types of sampling and its applications in geographical studies.
6. Inferential statistics: confidence intervals and hypothesis testing.

UNIT-IV

7. Measures of inequality: Loren curve, Gini's coefficient.
8. Bivariate analysis: scatter diagram, correlation (Spearman's rank correlation).

Suggested Readings:

1. Ashis Sarkar (2013), Quantitative Geography: Techniques and Presentations.
2. Gregory S. 1963. Statistical Methods and the Geography, Longman, London.
3. Mahmood. A. (1993): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
4. Rogerson. P.A. (2010), Statistical Methods for Geography, Sage Publication, New Delhi
5. Paul. S.K. (1998): Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Statistical Methods in Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-402.1	3.0	2.0	2.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	1.0
B-GEO-402.2	3.0	2.0	2.0	1.0	2.0	2.0	1.0	3.0	2.0	1.0	1.0
B-GEO-402.3	3.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	1.0
B-GEO-402.4	3.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	1.0	1.0
Average	3.0	2.0	2.0	1.5	1.8	2.0	1.5	2.8	2.5	1.0	1.0

Mapping of Course Outcomes to Program Specific Outcomes (Statistical Methods in Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-402.1	3.0	2.0	2.0	2.0
B-GEO-402.2	3.0	2.0	2.0	2.0
B-GEO-402.3	3.0	3.0	3.0	3.0
B-GEO-402.4	3.0	2.0	2.0	2.0
Average	3.0	2.3	2.3	2.3

Semester-IV
Core Course Code: B-GEO-403
Core Course Name: Maps and Diagrams (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-403.1:** Knowledge about different types of thematic maps.
B-GEO-403.2: Skill acquisition for construction of qualitative distribution maps.
B-GEO-403.3: Ability to construct quantitative thematic maps.
B-GEO-403.4: Capability to carry out prismatic compass survey.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise	= 24	File Record	= 08	Viva-voce	= 08
1. Principal of map design and layout					
2. Symbolization: point, line and area symbol					
3. Lettering and toponomy					
4. Mechanics of map construction					
5. Distribution maps					
(i) Qualitative distribution maps					
• Choro schematic maps				1 Exercise	
• Chorochromatic maps				2 Exercise	
(ii) Quantitative distribution Maps					
• Isopleth maps				3 Exercises	
• Choropleth maps				3 Exercises	
• Dot maps				3 Exercises	
• Diagrammatic maps				3 Exercises.	
6. Prismatic Compass Survey				2 Exercises.	

Suggested readings:

1. Mishra RP and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
2. Monkhouse FJ and Wilkinson HR. 1972. Maps and Diagrams, Methuen Press, London
3. Singh Gopal. 2004. Map Work and Practical Geography, Vikas Publication House, New Delhi.
4. Singh RL. 1979. Elements of Practical Geography, Kalyani Publishers, New Delhi

Mapping of Course Outcomes to Program Outcomes (Maps and Diagrams-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-403.1	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
B-GEO-403.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO-403.3	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO-403.4	3.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Average	3.0	2.5	2.5	2.0	2.0	2.0	2.0	2.5	2.0	1.3	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Maps and Diagrams-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-403.1	3.0	2.0	2.0	2.0
B-GEO-403.2	3.0	2.0	2.0	2.0
B-GEO-403.3	3.0	2.0	2.0	2.0
B-GEO-403.4	3.0	1.0	1.0	1.0
Average	3.0	1.8	1.8	1.8

Semester-IV
Skill Enhancement Course Code: B-GEO- SEC-404
Skill Enhancement Course Name: Map Reading and Interpretation

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO- SEC-404.1:** Knowledge about fundamentals of map reading.
B-GEO- SEC-404.2: Ability to determine the time at different locations in world.
B-GEO- SEC-404.3: Augmentation of knowledge about topographic features.
B-GEO- SEC-404.4: Development of skills to delineate drainage basin and measurement of height and slope.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Essentials and uses of maps.
2. Types of maps: topographic and thematic maps.
3. Reading of atlas maps.
4. Scales: definition, types and uses.
5. Directions: their measurement and compass bearing.
6. Latitudes and Longitudes: determination of location on maps using CGS and FPS system.
7. GMT and local time (CST, IST, CEST, BST, EST and PST) determination.

UNIT- II

8. Indexing of topographical maps (old and new scheme).
9. Relief features representation on topographic maps: Spot heights, Bench mark, Trigonometrical Points, Contours and Form lines, Hill Shading, Layer Colouring, Hachures.
10. Identification of features on topographic maps: Conical Hill, Plateau, V shaped Valley, U shaped Valley, Cliff, Waterfall, Escarpment, Saddle, Spur.
11. Measurements of height (shadow method).
12. Measurement of slope (clinometer method).
13. Profiles: their types and characteristics.
14. Principles of drainage basin delineation.

Suggested Readings:

1. Mishra RP and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
2. Monkhouse FJ and Wilkinson HR. 1972. Maps and Diagrams, Methuen Press, London
3. Singh Gopal. 2004. Map Work and Practical Geography, Vikas Publication House, New Delhi.
4. Singh RL. 1979. Elements of Practical Geography, Kalyani Publishers, New Delhi

Mapping of Course Outcomes to Program Outcomes (Map Reading and Interpretation)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO- SEC-404.1	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	2.0	2.0	2.0
B-GEO- SEC-404.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0
B-GEO- SEC-404.3	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO- SEC-404.4	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
Average	3.0	3.0	2.8	2.0	2.0	2.0	1.8	2.8	2.0	1.3	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Map Reading and Interpretation)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO- SEC-404.1	3.0	2.0	2.0	2.0
B-GEO- SEC-404.2	3.0	1.0	1.0	1.0
B-GEO- SEC-404.3	3.0	3.0	3.0	3.0
B-GEO- SEC-404.4	3.0	3.0	3.0	3.0
Average	3.0	2.3	2.3	2.3

Semester-IV
Skill Enhancement Course Code: B-GEO-SEC-405
Skill Enhancement Course Name: Reading and interpretation of Digital Maps

Time: $2\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-SEC-405.1:** Provides knowledge about reading and interpretation of digital maps.
B-GEO-SEC-405.2: Acquisition of skills about interpretation of satellite weather maps
B-GEO-SEC-405.3: Makes aware about classroom and scanning technology.
B-GEO-SEC-405.4: Understanding about global positioning system and digital navigation maps.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Reading of digital and web maps.
2. Reading and interpretation of satellite weather maps and imageries.
3. Reading and interpretation of photographs and imageries.

UNIT- II

4. Class room technology: white board, online world atlas and magazine maker
5. Scanning technology: types, significance and applications.
6. Applications of global positioning system and digital navigation maps.

Suggested Readings:

1. Tempfli K et al 2009. Principal of Remote Sensing, ITC Educational Textbook, the Netherland
2. John R. Jensen 2009. Remote Sensing of the Environment-An Earth Resource Perspective, Pearson Education, (India Edition) New Delhi.
3. Lillesand and R.W. Kiefer, 2005. Remote Sensing and Image Interpretation, John Wiley and Sons.

Mapping of Course Outcomes to Program Outcomes (Introduction to Digital Mapping)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-SEC-405.1	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO-SEC-405.2	3.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	1.0	2.0
B-GEO-SEC-405.3	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
B-GEO-SEC-405.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	1.0	2.0
Average	3.0	2.8	2.5	2.3	2.3	2.5	2.3	2.8	2.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Introduction to Digital Mapping)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-SEC-405.1	3.0	3.0	3.0	3.0
B-GEO-SEC-405.2	3.0	3.0	3.0	3.0
B-GEO-SEC-405.3	3.0	1.0	2.0	1.0
B-GEO-SEC-405.4	3.0	3.0	3.0	3.0
Average	3.0	2.5	2.8	2.5

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-501
Discipline Specific Elective Course Name: Agricultural Geography

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-501.1:** Acquittance with the basics of agricultural geography.
B-GEO-DSE-501.2: Ability to understand the determinants of agricultural patterns.
B-GEO-DSE-501.3: Enrichment of knowledge about world agricultural systems.
B-GEO-DSE-501.4: Understanding the skills of measurement of agricultural productivity and food security.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Definition, nature and scope of agricultural geography.
2. Physical, technological and institutional factors of agricultural patterns.
3. Basis of agricultural regionalization: land use, cropping pattern, crop combination, crop diversification.

UNIT- II

4. World agricultural regions based on Whittlesey's criteria.
5. Measurement of agricultural efficiency and productivity.
6. Food and nutritional security: availability, accessibility and utilization outcome of food in India.

Suggested Readings:

1. Bowler T.R. (1992) The Geography of Agriculture in Developed Market Economics, Longman.
2. Grigg D. (1995) Introduction to Agricultural Geography, Routledge, London.
3. Husain, Majid (1996), Systemic Agricultural Geography Rawat Publications, Jaipur.
4. Singh J. and Dhillon S.S. (1994) Agricultural Geography, Tata Mc Graw Hill, New Delhi.
5. Safi, Mohammad (2007) Agricultural Geography.

Mapping of Course Outcomes to Program Outcomes (Agricultural Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-501.1	3.0	2.0	2.0	3.0	2.0	1.0	3.0	3.0	2.0	2.0	2.0
B-GEO-DSE-501.2	3.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-501.3	3.0	1.0	1.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-501.4	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	1.0	2.0
Average	3.0	1.8	2.0	2.3	2.8	2.3	3.0	3.0	2.5	1.8	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Agricultural Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-501.1	3.0	2.0	3.0	2.0
B-GEO-DSE-501.2	3.0	3.0	2.0	3.0
B-GEO-DSE-501.3	3.0	2.0	3.0	2.0
B-GEO-DSE-501.4	3.0	3.0	2.0	3.0
Average	3.0	2.5	2.5	2.5

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-502
Discipline Specific elective Course Name: Resource Geography

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-502.1:** Acquaintance with the nature and field of resource geography.
B-GEO-DSE-502.2: Provides knowledge about concepts and models of natural resource utilization.
B-GEO-DSE-502.3: Enhancement of knowledge about development and conservation of natural resources.
B-GEO-DSE-502.4: Enrichment of knowledge about policies and problems of resource management in India.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Nature, scope and importance of resource geography.
2. Concepts of resource: exploitation, accumulation, poverty and resource degradation.
3. Models of natural resources process: Zimmermann primitive, Kirk's decision and Brookfield system model.

UNIT- II

4. Relationship between natural resources and development process.
5. Conservation and management methods: Soil, water, forest and mineral resources
6. Policies and problems of natural resource management in India

Suggested Readings:

1. Barbier, Edward B (2005) Natural Resources and Economic Development, Cambridge University Press.
2. Borton, I and R W Kates (1984) Readings in Resource Management and Conservation, University of Chicago Press, Chicago.
3. Bruce, Mitchell (1989) Geography and Resource Analysis, John Wiley and Son, New York.
4. Das Gupta, Biplob (1979) the Environmental Debate, Economic and Political Weekly, Vol.13, No. 6/7, Annual Number (Feb., 1978), pp. 385-387+389+391+393+395+397-400
5. Eliot Hurst, M E (1972) A Geography of Economic Behaviour: An Introduction, Duxbury Press, California.
6. Fabricius, C & Eddie Koch Eds. (2004) Rights, Resources and Rural Development: Community based Natural Resource Management in Southern Africa, Earthscan, London Sterling.
7. Guha, J L and P R Chattroj (1994) Economic Geography- A Study of Resources, The World Press Pvt. Ltd. Calcutta
8. Martino, R L (1969) Resource Management. Mc Graw Hill Book Co., London.
9. Negi, B S (2000) Geography of Resources, Kedar Nath and Ram Nath, Meerut
10. Owen, Oliver, S (1971) Natural Resource Conservation: A Ecological Approach, McMillan, New Delhi.
11. Raja, M (1989) Renewable Resources, Development, Concept Pub. New Delhi.
12. Ramesh, A (1984) Resource Geography (Ed.) R P Misra, Contribution to Indian Geography, Heritage Publishers, New Delhi.
13. UNDP & World Resource Institute (2005) The Wealth of the Poor—Managing Ecosystems to Fight Poverty, World Resources Institute, Washington, DC 20002
14. Zimmermann, E W (1951) World Resources and Industries, Harper and Brothers, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Resource Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-502.1	3.0	1.0	1.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-502.2	3.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-502.3	3.0	2.0	2.0	2.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-502.4	3.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	1.8	1.8	2.0	2.3	1.0	3.0	3.0	3.0	2.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Resource Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-502.1	3.0	2.0	2.0	1.0
B-GEO-DSE-502.2	3.0	3.0	3.0	2.0
B-GEO-DSE-502.3	3.0	3.0	2.0	2.0
B-GEO-DSE-502.4	3.0	3.0	3.0	2.0
Average	3.0	2.8	2.5	1.8

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-503
Discipline Specific Elective Course Name: Settlement Geography

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-503.1:** Familiarization with basic concepts of settlement geography.
B-GEO-DSE-503.2: Enhancement of knowledge about types and patterns of rural settlements.
B-GEO-DSE-503.3: Provides critical view about different models of internal structure of cities.
B-GEO-DSE-503.4: Augmentation of knowledge on socio-spatial problems of cities.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Nature and scope of settlement geography.
2. Concepts of rural settlements: hamlet and village; urban settlements: town, city, metropolis, megalopolis.
3. Types and patterns of rural settlements and their determinants.

UNIT- II

4. Urban land use models: concentric zone model, sector model and multiple nuclei model.
5. Urban problems: housing, poverty, water supply and sanitation.
6. Expansion of urban spaces: rural-urban fringe and interaction.

Suggested Reading:

1. Chishlom M., 2007: Rural Settlement and Land Use, Transaction Publishers.
2. Daniel, P. 2002: Geography of Settlement, Rawat Publications, Jaipur & New Delhi.
3. Ghosh, Santwana 1999: A Geography of Settlements, Orient Longman, Kolkata.
4. Kalia Ravi, 1999: Chandigarh: The Making of Indian City, Oxford University Press.
5. Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: Urban Geography, John Wiley.
6. Krishan G., 1999: Inner Spaces – Outer Spaces of a Planned City: A Thematic Atlas of Chandigarh, Celebrating Chandigarh.
7. Misra, R. P. & Misra, K. eds. 1998: Million Cities of India, Sustainable Development Foundation, New Delhi.
8. Pacione M., 2009: Urban Geography: A Global Perspective, Taylor and Francis.
9. Ramachandran R., 1989: Urbanization and Urban Systems of India, Oxford University Press.
10. Ramachandran, R., 1992: The Study of Urbanization, Oxford University Press, Delhi
11. Singh R. Y., 1994: The Geography of Settlement, Rawat Publication, New Delhi.
12. Tiwari, R. C. 2000: Settlement Geography, (in Hindi), Prayag Publ., Allahabad.

Mapping of Course Outcomes to Program Outcomes (Settlement Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-503.1	3.0	2.0	2.0	1.0	2.0	1.0	2.0	3.0	3.0	2.0	2.0
B-GEO-DSE-503.2	3.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-503.3	3.0	2.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-503.4	3.0	3.0	3.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
Average	3.0	2.3	2.3	1.5	2.0	1.0	2.8	3.0	3.0	2.0	1.3

Mapping of Course Outcomes to Program Specific Outcomes (Settlement Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-503.1	3.0	2.0	2.0	2.0
B-GEO-DSE-503.2	3.0	2.0	2.0	2.0
B-GEO-DSE-503.3	3.0	3.0	3.0	2.0
B-GEO-DSE-503.4	3.0	3.0	3.0	2.0
Average	3.0	2.5	2.5	2.0

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-504
Discipline Specific Elective Course Name: Transport Geography

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-504.1: Provides understanding the basic concepts of transport geography.

B-GEO-DSE-504.2: Enhancement of knowledge about the factors and spatial pattern of transportation systems.

B-GEO-DSE-504.3: Capable to understand relationship between transport and location of economic activities.

B-GEO-DSE-504.4: Enrichment of knowledge about problems and management of urban transportation systems.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Nature, scope, significance and development of transport geography.
2. Factors associated with development of transport system; physical, economic, social cultural and institutional.
3. Regional variations in transport density; traffic flow and regional interaction; Bases of spatial interaction.

UNIT-III

4. Transport and locational activities; Impact of different aspects of transport on spatial equilibrium of location; problem of location and regional development.
5. Transportation network: Function, pattern and geometry; Models of network change.
6. Problems of urban transportation: transportation and environmental degradation; vehicular pollution and congestion; alternative to transport system in Mega-cities.

Suggested Readings:

1. Ashton, W.D., (1966): The Theory of Traffic Flow, Methuen, London
2. Bhaduri, S. 1992. Transport and Regional Development, Concept Publishing Company, New Delhi.
3. Berry, B.J.L et al. (1966): Essays on Commodity Flow and Spatial Structure of Indian Economy, Department of Geography, Chicago.
4. Berry, B.L.J. and Marble, D.F. (eds.) (1971): Spatial Analysis: A Reader in Statistical Geography, Prentice Hall.
5. Brooks, P.W., (1994): The Development of Air Transport Hurst, M.E. (ed.) Transportation geography: Comments and Reading, Mc Graw Hill, 256-273
6. Cooley, C.H. (1994): The Theory of Transportation, in Hurst, M.E. (ed.) Transportation geography: Comments and Reading, Mc Graw Hill, 15-29.
7. Fleming, D.K. and Hayuth, Y. (1994): Spatial Characteristics of Transportation Hubs: Centrality and Intermediacy, Journal of Transport Geography, 2 (1), 3-18.
8. Gautam, P.S. (1992) Transport Geography of India: A Study of Chambal Division, M.P., Mittal Publications, New Delhi
9. Huggett, P. (1965) Locational Analysis in Human Geography, Methuen, London.
10. Huggett, P. and Chorley, R.J. (1969) Networks in Geography, London.
11. Hay, A. 1973. Transport Economy, Macmillan, London.
12. Hoyle, B. S. and Knowles, R. 2000, Modern Transport Geography. John Wiley and Sons, New York.
13. Hoyle, B.S. 1973. Transport and Development. Macmillan, London.
14. Husain, M. and Zaidi, S.S.H. 1996. Environmental Management in India. Concept Publications, New Delhi.
15. Kensky, K.J., (1963): Structure of Transportation Networks: Relationships between Network Geometry and Regional Characteristics, University of Chicago, Department of Geography, Research Paper, Chicago, 84.

16. Nagar, V.D. and Gautam S. (1984): Principles and Problems of Indian Transport, Kailash PustakSadan, Gwalior.
17. Owen, W. (1968): Distance and Development: Transport and Communications in India, Washington.
18. Raza, M. and Aggarwal, Y., (1986) Transport Geography of India, Concept Publishing Company, New Delhi.
19. Taaffe, E.J. et al. (1963) Transport Expansion in Underdeveloped Countries: A Comparative Analysis, Geographical Review, 53:503-29.
20. Vaidya, B.C. 1998. Readings in Transport Geography, Devika Publications, New Delhi.
21. White, H. P. and Senior, M.L. (1983) Transportation Geography, Longman, London.

Mapping of Course Outcomes to Program Outcomes (Transport Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-504.1	3.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	1.0
B-GEO-DSE-504.2	3.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-504.3	3.0	2.0	3.0	2.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-504.4	3.0	2.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.0	2.0	1.5	2.3	1.3	2.8	2.8	2.8	2.0	1.5

Mapping of Course Outcomes to Program Specific Outcomes(Transport Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-504.1	3.0	2.0	2.0	1.0
B-GEO-DSE-504.2	3.0	2.0	3.0	2.0
B-GEO-DSE-504.3	3.0	3.0	3.0	2.0
B-GEO-DSE-504.4	3.0	2.0	3.0	2.0
Average	3.0	2.8	2.8	1.8

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-505
Discipline Specific Elective Course Name: Map Projections (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-505.1:** Acquaintance with nature and significance of projections system.
B-GEO-DSE-505.2: Augmentation of skills to make cylindrical and conical projections.
B-GEO-DSE-505.3: Capability to construct zenithal and world map projections.
B-GEO-DSE-505.4: Enrichment of surveying skills using plane table.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise	= 24	File Record	= 08	Viva-voce	= 08
1.	Introduction to Map Projection: Meaning, Classification and importance; Characteristics of latitudes and longitudes lines.				
2.	Cylindrical projections: Characteristics, applications and drawing;			3 exercise	
	(i) Simple cylindrical projection				
	(ii) Cylindrical equal area projection.				
	(iii) True shape or orthomorphic or Mercator's Projection.				
3.	Conical Projections: Characteristics, applications and drawing.			5 exercise	
	(i) Simple conical projections with one standard parallel				
	(ii) Simple conical projection with two standards parallel				
	(iii) Bonne's Projection				
	(iv) Polyconic projection.				
	(v) International Map Projection.				
4.	Zenithal Projections: Characteristics, applications and drawing.			5 exercise	
	(i) Polar Zenithal Equidistant Projection.				
	(ii) Polar Zenithal Equal Area Projection				
	(iii) Polar Zenithal Gnomonic Projection				
	(iv) Polar Zenithal Stereographic Projection.				
	(v) Polar Zenithal Orthographic Projection				
5.	Characteristics, applications and drawings of:			2 exercise	
	(i) Sinusoidal and				
	(ii) Mollweide Projections				
6.	Plane Table Survey.			2 exercise	

Suggested Readings:

1. Khan, A.A. 1996. Text Book of Practical Geography, Concept, New Delhi.
2. Lawrence, GRP.1968. Cartographic Methods, Methuen, London.
3. Mishra R.P. and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
4. Monkhouse, F.J. and Wilkinson, H.R. 1994. Maps and Diagrams, Methuen, London.
5. Robinson, A.H. et.al. Elements of Cartography, John Wiley & Sons, 1995.
6. Singh, R.L., 1979. Elements of Practical Geography, Kalyani Publisher, New Delhi.
7. Sarkar, A.K 1997: Practical Geography-A Systematic Approach, Orient Longman, Calcutta.
8. Steers, J.B. Map Projections; University of London Press, London.

Mapping of Course Outcomes to Program Outcomes (Map Projections-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-505.1	3.0	1.0	3.0	2.0	1.0	3.0	3.0	3.0	1.0	1.0	1.0
B-GEO-DSE-505.2	3.0	2.0	3.0	2.0	1.0	3.0	3.0	3.0	1.0	1.0	1.0
B-GEO-DSE-505.3	3.0	1.0	3.0	2.0	2.0	3.0	3.0	3.0	1.0	2.0	1.0
B-GEO-DSE-505.4	3.0	2.0	3.0	3.0	1.0	2.0	3.0	3.0	1.0	2.0	1.0
Average	3.0	1.5	3.0	2.3	1.3	2.8	3.0	3.0	1.0	1.5	1.0

Mapping of Course Outcomes to Program Specific Outcomes(Map Projections-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-505.1	3.0	2.0	2.0	3.0
B-GEO-DSE-505.2	3.0	3.0	2.0	3.0
B-GEO-DSE-505.3	3.0	3.0	3.0	3.0
B-GEO-DSE-505.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.5	3.0

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-506
Discipline Specific Elective Course Name: Socio-economic Field Survey (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-506.1:** Makes students confident in handling field situations.
B-GEO-DSE-506.2: Gives opportunity to identify socio-economic problem.
B-GEO-DSE-506.3: Awareness about sampling techniques for data collection in the field.
B-GEO-DSE-506.4: Training of retrieval, analysis and interpretation of socio-economic field data.

Note for Paper Setters: Examiner will have to evaluate the candidate on the basis of field report prepared by the student.

Distribution of Marks for Evaluation of Project Report

Field Report: 24 marks

Viva-voce on report: 16 marks

Note: The students will carry out the socio-economic survey of a village or urban locality of at least 100 households/respondents and will prepare a field report.

Suggested Readings:

1. Black James A and D.J. champion (1976): Methods and Issues in social Research, New York, John Wiley and Sons, Inc.
2. Goode and Hat, Research Methodology in Social Sciences, Oxford University Press, New Delhi.
3. Har Prasad (1992): Research Methods and Techniques in Geography, Rawat Publishers, Jaipur.
4. Mishra, H.N. and Singh V.P. (ed.) (1998), Research Methodology: Social, Spatial and Policy Dimensions, Rawat Publishers, Jaipur.

Mapping of Course Outcomes to Program Outcomes (Socio-economic Field Survey-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-506.1	1.0	1.0	1.0	3.0	3.0	2.0	2.0	3.0	1.0	2.0	2.0
B-GEO-DSE-506.2	1.0	1.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	2.0	2.0
B-GEO-DSE-506.3	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-506.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0
Average	2.0	1.8	2.5	3.0	3.0	2.3	2.8	3.0	2.3	2.3	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Socio-economic Field Survey-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-506.1	2.0	2.0	3.0	3.0
B-GEO-DSE-506.2	2.0	3.0	3.0	3.0
B-GEO-DSE-506.3	3.0	3.0	3.0	3.0
B-GEO-DSE-506.4	3.0	3.0	3.0	3.0
Average	2.5	2.8	3.0	3.0

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-507
Discipline Specific Elective Course Name: MOOC Course from Swayam Portal

Semester-V
Generic Elective Course Code: B-GEO-GE-508
Generic Elective Course Name: India: General Geography

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks: 80
Internal Assessment Marks: 20

Course outcomes (COs):

B-GEO-GE-508.1: Provides an understanding about the location and geographical expansion of India.

B-GEO-GE-508.2: Acquaintance with the geophysical structure of India.

B-GEO-GE-508.3: Enrichment of knowledge about peopling and distribution of population.

B-GEO-GE-508.4: Capability to understand the regional diversity and unity in India.

Note for Paper Setters: Question 1 is compulsory comprising of eight sub parts spread over entire syllabus (two 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-I

1. India: locational setting and geographical expansion
2. Relief and drainage systems.

UNIT-II

3. Climate, soil and natural vegetation.
4. Physiographic regions of India

UNIT-III

5. Distribution of human races and peopling of India.
6. Population: distribution, density and growth

UNIT-IV

7. Population composition: ethnic and socio-cultural attributes (caste, tribes and religion)
8. Regional diversity and unity in India

Suggested Readings:

1. Ahmed, A, India: A General Geography, NCERT, New Delhi.
2. Hussain, Majid Geography of India, McGraw Hill Education Series
3. Qureshi, M. H. India: People and Economy, NCERT, New Delhi.
4. Qureshi, M.H. India: Physical Environment, NCERT, New Delhi.
5. Tiwari, RC, Geography of India, PrayagPustak Bhawan, Allahabad.

Mapping of Course Outcomes to Program Outcomes (India: General Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-GE-508.1	3.0	3.0	1.0	1.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-GE-508.2	3.0	3.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0
B-GEO-GE-508.3	3.0	2.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-GE-508.4	3.0	2.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	1.0	2.0
Average	3.0	2.5	1.8	1.8	2.8	1.3	2.3	3.0	2.3	1.3	2.3

Mapping of Course Outcomes to Program Specific Outcomes(India: General Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-GE-508.1	3.0	2.0	3.0	2.0
B-GEO-GE-508.2	3.0	3.0	3.0	3.0
B-GEO-GE-508.3	3.0	2.0	3.0	3.0
B-GEO-GE-508.4	3.0	3.0	3.0	2.0
Average	3.0	2.5	3.0	2.5

Time: 3 Hours
Credits: 2

5829

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-601
Discipline Specific Elective Course Name: Fundamental of Remote Sensing

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-601.1:** Acquaintance with fundamentals of remote sensing
B-GEO-DSE-601.2: Capability to interpret aerial photographs
B-GEO-DSE-601.3: Enrichment of skills to extract information from imageries.
B-GEO-DSE-601.4: Understanding the applications of remote sensing.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Introduction to aerial photographs: types and advantages.
2. Elements of aerial photo interpretation.
3. Digital photographs: sources and interpretation.

UNIT-II

4. Space borne remote sensing: electromagnetic spectrum, stages in remote sensing,
5. Type of satellites, nature of data and utility.
6. Applications of remote sensing: agriculture, environment and resource mapping.

Suggested Readings:

1. John R. Jensen 2009. Remote Sensing of the Environment-An Earth Resource Perspective, Pearson Education, (India Edition) New Delhi.
2. Kumar Meenakshi 2001. Remote Sensing, NCERT, New Delhi.
3. Lillesand and R.W. Kiefer, 2005. Remote Sensing and Image Interpretation, John Wiley and Sons.
4. Pritvish Nag, and M. Kudrat 1998. Digital Remote Sensing, Concept Publishing Company, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Remote Sensing)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-601.1	3.0	2.0	3.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	2.0
B-GEO-DSE-601.2	3.0	1.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-601.3	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
B-GEO-DSE-601.4	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0
Average	3.0	2.3	3.0	2.0	2.8	3.0	2.8	2.5	2.8	2.3	2.5

Mapping of Course Outcomes to Program Specific Outcomes(Remote Sensing)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-601.1	3.0	2.0	3.0	3.0
B-GEO-DSE-601.2	3.0	3.0	2.0	3.0
B-GEO-DSE-601.3	3.0	3.0	3.0	3.0
B-GEO-DSE-601.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.8	3.0

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-602
Discipline Specific Elective Course Name: Introduction to Geospatial Technology

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-602.1:** Acquaintance with the fundamentals of geo-spatial technology.
B-GEO-DSE-602.2: Capability to understand geographical information systems hardware, software and data types.
B-GEO-DSE-602.3: Knowledge about types and functioning of global positioning system.
B-GEO-DSE-602.4: Understanding about the applications of geospatial technology.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Introduction to geo-spatial technology: remote sensing, geographical information systems and global positioning system
2. Elements of geographical information system: hardware, software and data requirements.
3. Structure of spatial and non-spatial data and data base management system.

UNIT-II

4. Application of geographical information system in urban, regional and real time planning.
5. Global positioning system: types and functioning.
6. Applications of global positioning system and mobile mapping.

Suggested Readings:

1. Burrough, P.A. and McDonnell, R. (1998). Principles of Geographic Information Systems. Oxford University Press, Oxford.
2. Bhatta Basudeb (2014). Remote Sensing and GIS. Oxford University Press, Oxford.
3. Guha Pardeep (2013). Remote Sensing for the Beginner. East West Press, New Delhi.
4. Heywood I, Cornelius S and Carver S. 2000. An Introduction to Geographical Information Systems, Longman, New York.
5. Meenakshi Kumar (2000). Text Book on Remote Sensing. NCERT, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Geo-spatial Technology)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-602.1	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0
B-GEO-DSE-602.2	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
B-GEO-DSE-602.3	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-602.4	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.5	3.0	2.0	3.0	3.0	3.0	3.0	2.8	2.0	2.3

Mapping of Course Outcomes to Program Specific Outcomes(Geo-spatial Technology)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-602.1	3.0	2.0	3.0	2.0
B-GEO-DSE-602.2	3.0	3.0	3.0	3.0
B-GEO-DSE-602.3	3.0	3.0	3.0	3.0
B-GEO-DSE-602.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	3.0	2.8

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-603
Discipline Specific Elective Course Name: Geography of Asia

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-603.1:** Awareness about physiographic structure of Asia.
B-GEO-DSE-603.2: Knowledge about the characteristics of people.
B-GEO-DSE-603.3: Understanding about distribution pattern of major crops and cropping pattern.
B-GEO-DSE-603.4: Acquaintance with the distribution pattern of major minerals and industries.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Physiographic characteristics, climate, natural vegetation and major river systems
2. Demographic attributes: population distribution, density, growth and urbanization.
3. Socio-cultural attributes: languages, religions and races.

UNIT-II

4. Agriculture: area, production and yield of wheat, rice, sugarcane, cotton, tea, coffee and rubber.
5. Minerals distribution and production: iron-ore, manganese, mica, coal and petroleum.
6. Major industries and trade: textile, iron and steel, petro-chemicals, automobiles and electronics.

Suggested Readings:

1. Farmer, B. H. (1993): An Introduction to South Asia, Routledge Publications, London.
2. Hussain, M. (2012) World Geography, Rawat, Jaipur.
3. Memoria, C. and Aggarwal, M.L. (2018) Geography of Asia, Sahitya Bhawan, New Delhi.
4. Sharma, Y.K. (2019) Geography of Asia, Lakshmi Narain Aggarwal Publisher, New Delhi.
5. Stamp L.D. (1952) Asia: A Regional and Economic Geography, Methuen, London.
6. Tirtha, R. (2006) Geography of Asia, Rawat publication, Jaipur.

Mapping of Course Outcomes to Program Outcomes (Geography of Asia)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-603.1	3.0	1.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	1.0	2.0
B-GEO-DSE-603.2	3.0	2.0	2.0	2.0	3.0	1.0	2.0	3.0	3.0	2.0	2.0
B-GEO-DSE-603.3	3.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	3.0	2.0	2.0
B-GEO-DSE-603.4	3.0	2.0	2.0	1.0	1.0	1.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.0	2.0	1.5	2.0	1.0	2.5	3.0	3.0	1.8	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Geography of Asia)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-603.1	3.0	2.0	2.0	2.0
B-GEO-DSE-603.2	3.0	2.0	2.0	2.0
B-GEO-DSE-603.3	3.0	2.0	2.0	2.0
B-GEO-DSE-603.4	3.0	2.0	2.0	2.0
Average	3.0	2.0	2.0	2.0

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-604
Discipline Specific Elective Course Name: Geography of Europe

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-604.1:** Awareness about physiographic structure of Europe.
B-GEO-DSE-604.2: Knowledge about the demographic characteristics of people.
B-GEO-DSE-604.3: Acquaintance with distribution pattern of agriculture, forestry and fisheries.
B-GEO-DSE-604.4: Understanding the distribution pattern of minerals, industries and international trade.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Physical features: relief, physiographic regions, climate, drainage, soils and natural vegetation.
2. Demographic characteristics: population distribution, density and growth.
3. Socio-cultural attributes: languages, ethnic groups and migrant groups.

UNIT-II

4. Agriculture, forestry and fisheries.
5. Distribution of major minerals and industries.
6. International trade, transport and communication, European Union.

Suggested Readings:

1. Brian W. Blouet(2007), The EU and Neighbors: A Geography of Europe in the Modern, Wiley Publishers.
2. Eduard A. Koster (2005), A Physical Geography of Western Europe (Oxford Regional Environments), Oxford University Press.
3. Goran Mutabdzija (2018), Regional Geography of Europe, Independently Published.
4. Jean Gottmann (1969), Geography of Europe, Holt McDougal, California.
5. Thomas Alford Smith (2012), A Geography of Europe, Rare Books Club.

Mapping of Course Outcomes to Program Outcomes (Geography of Europe)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-604.1	3.0	1.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-604.2	3.0	1.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-604.3	3.0	2.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-604.4	3.0	2.0	2.0	1.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	1.5	2.0	1.0	2.0	1.3	3.0	3.0	3.0	2.0	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Geography of Europe)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-604.1	3.0	2.0	2.0	2.0
B-GEO-DSE-604.2	3.0	2.0	2.0	2.0
B-GEO-DSE-604.3	3.0	3.0	2.0	2.0
B-GEO-DSE-604.4	3.0	2.0	3.0	2.0
Average	3.0	2.3	2.3	2.0

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-605
Discipline Specific Elective Course Name: Elementary Remote Sensing (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-605.1:** Familiarization with the skill of measurements on aerial photographs.
B-GEO-DSE-605.2: Development of art of visualizing 3-D surface on photographs.
B-GEO-DSE-605.3: Capability to read and interpret physical and cultural features on photographs.
B-GEO-DSE-605.4: Ability to extract features from satellite imageries.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks

Exercise	= 24	File Record	= 08	Viva-voce	= 08
1. Demarcation of principal point				1 exercise	
2. Conjugate principal point				1 exercise	
3. Flight line				1 exercise	
4. Determination of scale of photograph				1 exercise.	
5. Making of 3-D using stereoscope				1 exercise.	
6. Reading of ZESIS card				1 exercise	
7. Interpretation of physical features from aerial photograph				1 exercise.	
8. Interpretation of cultural features from aerial photograph				1 exercise	
9. Demarcation of land use from aerial photograph				1 exercise	
10. Identification of satellite imagery of an area using row and path				1 exercise	
11. Construction of spectral reflectance curves of ground features				1 exercise	
12. Interpretation of a satellite imagery				1 exercise	

Suggested Readings:

1. Bhatta Basudeb (2014). Remote Sensing and GIS. Oxford University Press, Oxford.
2. Guha Pardeep (2013). Remote Sensing for the Beginner. East West Press, New Delhi.
3. Kumar Meenakshi 2001. Remote Sensing, NCERT, New Delhi.
4. Lillesand and R.W. Kiefer, 2005. Remote Sensing and Image Interpretation, John Wiley and Sons.
5. Pritvish Nag, and M. Kudrat 1998. Digital Remote Sensing, Concept Publishing Company, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Elementary Remote Sensing-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-605.1	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	1.0	2.0
B-GEO-DSE-605.2	3.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0	2.0	2.0	2.0
B-GEO-DSE-605.3	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-605.4	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.3	3.0	2.3	3.0	3.0	2.8	3.0	2.8	1.8	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Elementary Remote Sensing-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-605.1	3.0	3.0	3.0	2.0
B-GEO-DSE-605.2	3.0	2.0	3.0	3.0
B-GEO-DSE-605.3	3.0	3.0	3.0	3.0
B-GEO-DSE-605.4	3.0	3.0	3.0	2.0
Average	3.0	2.8	3.0	2.5

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-606
Discipline Specific Elective Course Name: Physical Field Survey (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-606.1:** Makes students confident in handling field situations.
B-GEO-DSE-606.2: Gives opportunity to identify geo-physical problems.
B-GEO-DSE-606.3: Awareness about techniques for data collection in the field.
B-GEO-DSE-606.4: Training of analysis and interpretation of physical field data.

Note for Paper Setters: Examiner will have to evaluate the candidate on the basis of field report prepared by the student.

Distribution of Marks for Evaluation of Project Report

Field Report: 24 marks

Viva-voce on report: 16 marks

Note: The students will carry out the survey of physical environment of a site such as landforms, climate, soils, drainage and natural vegetation under the supervision of a teacher and will prepare a field report.

Suggested Readings:

1. Ahmed L, Kanth RA, Parvez S and Mahdi S. 2017. Experimental Agrometeorology-A Practical Manual. Springer Publication.
2. Bunnet RB. 1965. Physical Geography in Diagrams. Pearson Education, NOIDA, India.
3. Ghosh RK. 1999. Practical Hydrology. Roman Printers Pvt. Ltd. Howrah, West Bengal.
4. Gomez B and John Paul Jones. 2010. Research Methods in Geography-A Critical Introduction. Wiley Blackwell Publications, Singapore.
5. Goudie A. 1990. Geomorphological Techniques. Unwin Hyman, London.
6. Walsh MK. 2014. Teaching Geographic Field Methods using Paleocology. Journal of Geography 113: 97-106.

Mapping of Course Outcomes to Program Outcomes (Physical Field Survey-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-606.1	1.0	3.0	3.0	3.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-606.2	2.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-606.3	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-606.4	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Average	2.3	2.5	3.0	3.0	3.0	1.8	3.0	3.0	3.0	2.3	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Physical Field Survey-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-606.1	1.0	3.0	2.0	3.0
B-GEO-DSE-606.2	2.0	3.0	3.0	3.0
B-GEO-DSE-606.3	3.0	3.0	3.0	3.0
B-GEO-DSE-606.4	3.0	3.0	2.0	3.0
Average	2.3	3.0	2.5	3.0

Semester-VI
Generic Elective Course Code: B-GEO-GE-607
Generic Elective Course Name: World: General Geography

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks: 80
Internal Assessment Marks: 20

Course outcomes (COs):

- B-GEO-GE-607.1:** Provides an understanding about the geographical expansion of continents and oceans.
B-GEO-GE-607.2: Acquaintance with the geophysical structure of world.
B-GEO-GE-607.3: Enrichment of knowledge about ethnic and religious composition of world population.
B-GEO-GE-607.4: Capability to understand the population characteristics and economies of the world.

Note for Paper Setters: Question 1 is compulsory comprising of eight sub parts spread over entire syllabus (two 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-I

1. Continents and oceans: their location, expansion and geographical characteristics.
2. World major physiographic units: mountain, plains and plateaus.

UNIT-II

3. World climates and major climatic regions
4. Major soil types and natural vegetation.

UNIT-III

5. Human biological diversity, ethnicity and distribution of races
6. Major religions of world and their distribution.

UNIT-IV

7. Population: distribution, density and growth
8. World economy: characteristics of developed and developing economies.

Suggested Readings:

1. Hussain, Majid (2006) World Geography, Rawat Publishers, New Delhi.
2. McDougal, Holt (2010) World Geography, HMH Publishing Co.
3. Pounds and Taylor (1974) World Geography, South Western Publishing Co., Ohio.

Mapping of Course Outcomes to Program Outcomes (World: General Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-GE-607.1	3.0	3.0	1.0	1.0	1.0	1.0	1.0	3.0	2.0	1.0	2.0
B-GEO-GE-607.2	3.0	3.0	2.0	1.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-GE-607.3	3.0	2.0	1.0	1.0	1.0	1.0	2.0	3.0	2.0	1.0	1.0
B-GEO-GE-607.4	3.0	3.0	2.0	1.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0
Average	3.0	2.8	1.5	1.0	1.0	1.0	1.8	3.0	2.0	1.0	1.8

Mapping of Course Outcomes to Program Specific Outcomes(World: General Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-GE-607.1	3.0	2.0	2.0	1.0
B-GEO-GE-607.2	3.0	3.0	3.0	3.0
B-GEO-GE-607.3	3.0	2.0	2.0	2.0
B-GEO-GE-607.4	3.0	2.0	3.0	3.0
Average	3.0	2.3	2.5	2.3

Semester-VI
Generic Elective Course Code: B-GEO-GE-608
Generic Elective Course Name: World: General Geography (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-GE-608.1:** Ability to identify the physiographic features of the world.
B-GEO-GE-608.2: Skills to represent distribution of climate, soils and natural vegetation.
B-GEO-GE-608.3: Capability to map the population attributes of world.
B-GEO-GE-608.4: Competence to show distribution of tribes, religions and development process.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise = 24 File Record = 08 Viva-voce = 08

1. Location and distribution of features on outline map of world:

- | | |
|--|------------|
| (a) Major mountain ranges of the world | 1 exercise |
| (b) Major deserts of the world | 1 exercise |
| (c) Major plains of the world | 1 exercise |
| (d) Main plateaus of the world | 1 exercise |
| (e) Main rivers of the world | 1 exercise |
| (f) Major climatic divisions of the world | 1 exercise |
| (g) Distribution of annual rainfall in the world | 1 exercise |
| (h) Main vegetation types of the world | 1 exercise |
| (i) Major soils of the world | 1 exercise |
| (j) Distribution of population in the world | 1 exercise |
| (k) Distribution of density of population | 1 exercise |
| (l) Distribution of growth of population | 1 exercise |
| (m) Major tribal regions of the world | 1 exercise |
| (n) Distribution of major religions of the world | 1 exercise |
| (o) Distribution of different types of world economies | 1 exercise |
| (p) Distribution of human development index in the world | 1 exercise |

Suggested Readings:

1. Hussain, Majid (2006) World Geography, Rawat Publishers, New Delhi.
2. McDougal, Holt (2010) World Geography, HMM Publishing Co.
3. Pounds and Taylor (1974) World Geography, South Western Publishing Co., Ohio.

Mapping of Course Outcomes to Program Outcomes (World: General Geography-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-GE-608.1	3.0	3.0	2.0	1.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-GE-608.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO-GE-608.3	3.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-GE-608.4	3.0	2.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0
Average	3.0	2.8	2.3	1.8	1.5	1.3	2.0	3.0	2.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes((World: General Geography-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-GE-608.1	3.0	2.0	3.0	3.0
B-GEO-GE-608.2	3.0	3.0	3.0	2.0
B-GEO-GE-608.3	3.0	3.0	3.0	2.0
B-GEO-GE-608.4	3.0	2.0	2.0	2.0
Average	3.0	2.5	2.8	2.3

Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes (BA Humanities Geography)

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
B-GEO-101	3.0	2.5	1.8	1.5	2.5	1.3	2.5	3.0	2.8	1.3	2.3	3.0	2.5	3.0	2.5
B-GEO-102	3.0	3.0	2.5	1.8	3.0	1.8	2.5	3.0	2.8	1.5	2.5	3.0	3.0	2.5	2.5
B-GEO-103	3.0	2.0	1.5	1.5	2.3	2.8	2.0	3.0	1.0	1.3	2.3	3.0	1.8	2.8	2.0
B-GEO-201	3.0	2.8	2.8	2.3	3.0	2.3	2.8	3.0	3.0	1.8	2.5	3.0	2.8	2.5	2.5
B-GEO-202	3.0	2.8	1.8	1.5	2.8	1.0	1.5	3.0	2.0	1.8	1.8	3.0	2.0	2.8	2.5
B-GEO-203	3.0	2.5	2.5	2.5	2.8	2.3	2.3	3.0	1.8	2.0	3.0	3.0	2.8	3.0	3.0
B-GEO-301	3.0	3.0	2.0	2.0	1.5	1.0	2.0	3.0	2.0	1.0	2.0	3.0	1.0	1.0	3.0
B-GEO-302	3.0	2.8	2.3	2.8	1.8	1.5	2.3	3.0	2.0	2.0	2.3	3.0	3.0	3.0	3.0
B-GEO-303	3.0	2.8	2.0	2.3	1.8	2.0	1.8	2.5	1.8	1.8	1.8	2.8	2.5	2.5	2.8
B-GEO-401	3.0	2.5	2.0	1.8	1.5	1.3	1.8	3.0	2.0	2.0	2.0	2.8	2.0	2.8	2.5
B-GEO-402	3.0	2.0	2.0	1.5	1.8	2.0	1.5	2.8	2.5	1.0	1.0	3.0	2.3	2.3	2.3
B-GEO-403	3.0	2.5	2.5	2.0	2.0	2.0	2.0	2.5	2.0	1.3	2.0	3.0	1.8	1.8	1.8
B-GEO-SEC-404	3.0	3.0	2.8	2.0	2.0	2.0	1.8	2.8	2.0	1.3	1.8	3.0	2.3	2.3	2.3
B-GEO-SEC-405	3.0	2.8	2.5	2.3	2.3	2.5	2.3	2.8	2.0	1.0	2.0	3.0	2.5	2.8	2.5
B-GEO-DSE-501	3.0	1.8	2.0	2.3	2.8	2.3	3.0	3.0	2.5	1.8	2.0	3.0	2.5	2.5	2.5
B-GEO-DSE-502	3.0	1.8	1.8	2.0	2.3	1.0	3.0	3.0	3.0	2.0	2.0	3.0	2.8	2.5	1.8
B-GEO-DSE-503	3.0	2.3	2.3	1.5	2.0	1.0	2.8	3.0	3.0	2.0	1.3	3.0	2.5	2.5	2.0
B-GEO-DSE-504	3.0	2.0	2.0	1.5	2.3	1.3	2.8	2.8	2.8	2.0	1.5	3.0	2.8	2.8	1.8
B-GEO-DSE-505	3.0	1.5	3.0	2.3	1.3	2.8	3.0	3.0	1.0	1.5	1.0	3.0	2.8	2.5	3.0
B-GEO-DSE-506	2.0	1.8	2.5	3.0	3.0	2.3	2.8	3.0	2.3	2.3	2.0	2.5	2.8	3.0	3.0
B-GEO-DSE-507															
B--GE-508*															
B--GE-509*															
B-GEO-DSE-601	3.0	2.3	3.0	2.0	2.8	3.0	2.8	2.5	2.8	2.3	2.5	3.0	2.8	2.8	3.0
B-GEO-DSE-602	3.0	2.5	3.0	2.0	3.0	3.0	3.0	3.0	2.8	2.0	2.3	3.0	2.8	3.0	2.8
B-GEO-DSE-603	3.0	2.0	2.0	1.5	2.0	1.0	2.5	3.0	3.0	1.8	2.0	3.0	2.0	2.0	2.0
B-GEO-DSE-604	3.0	1.5	2.0	1.0	2.0	1.3	3.0	3.0	3.0	2.0	1.8	3.0	2.3	2.3	2.0
B-GEO-DSE-605	3.0	2.3	3.0	2.3	3.0	3.0	2.8	3.0	2.8	1.8	2.0	3.0	2.3	3.0	2.3
B-GEO-DSE-606	2.3	2.5	3.0	3.0	3.0	1.8	3.0	3.0	3.0	2.3	2.0	2.3	3.0	2.5	3.0
B--GE-608*															
B--GE-609*															

* Code will be decided as per the choice of student from the group of generic electives.

Attainment of COs:

The attainment of COs can be measured on the basis of the results of internal assessment and semester examination. The attainment is measured on scale of 3 after setting the target for COs attainment. **Following table** shows the CO attainment levels assuming the set target of 60% marks:

CO Attainment Levels for internal assessment

Attainment Level	
1 (low level of attainment)	60% of students score more than 60% of marks in class tests of a course.
2 (Medium level of attainment)	70% of students score more than 60% of marks in class tests of a course.
3 (High level of attainment)	80% of students score more than 60% of marks in class tests of a course.

Note: In the above table, the set target is assumed as 60%. It may vary in different departments/institutes. The staff councils of the departments/institutes may finalize the set target.

A proper mapping of course outcomes with assessment methods should be defined before measuring the attainment level. The questions in tests for internal assessment are based on COs. Here it is assumed that class test-I is based on first two COs (i.e. **B-GEO-101.1** and **B-GEO-101.2**) of a course with equal weightage given to both COs. Similarly, class test-II is based on next two COs (i.e. **B-GEO-101.3** and **B-GEO-101.4**) of a course with equal weightage given to these two COs. For each internal assessment test, the percentage of students attaining the target level of CO is estimated and average percentage will decide the attainment level

of COs. Following steps may be followed for determining the attainment level in internal assessment of a course.

- (i) Estimate the %age of students scoring set target (say 60%) or more in the question(s) of test -I based on first CO i.e. **B-GEO-101.1.**
- (ii) Estimate the %age of students scoring set target (60%) or more in the question(s) of test-I based on second CO i.e. **B-GEO-101.2.**
- (iii) Estimate the %age of students scoring set target (60%) or more in the question(s) of test-II based on third CO i.e. **B-GEO-101.3.**
- (iv) Estimate the %age of students scoring set target (60%) or more in the question(s) of test-II based on the fourth CO i.e. **B-GEO-101.4.**
- (v) Take average of the percentages obtained above.
- (vi) Determine the attainment level i.e. 3,2 or 1 as per scale defined in **the above table.**

Note: In the above steps, it is assumed that internal assessment is based on two tests only. However, if internal assessment is based on more than two tests and/or on assignments then same may be incorporated to determine the COs attainment level. There may be more than four COs for a course. The set target may also be different for different COs. These issues may be resolved by the staff councils of the departments/institutes.

For determining the attainment levels for end semester examination, it is assumed that questions in the end term examination are based on all COs of the course. Attainment levels for end semester examination of a course can be determined after the declaration of the results. The CO attainment levels for end semester examination are given in **the following Table.**

CO Attainment Levels for End Semester Examination (ESE)

Attainment Level	
1 (Low level of attainment)	60% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
2 (Medium level of attainment)	70% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
3 (High level of attainment)	80% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.

Note: In the above table, the set target is assumed as grade A for CBCS courses and 60% for non-CBCS courses. It may vary in different departments/institutes. The staff councils of the departments/institutes may finalize the set target.

Overall CO Attainment level of a Course:

The overall CO attainment level of a course can be obtained as:

$$\text{Overall CO attainment level} = 50\% \text{ of CO attainment level in internal assessment} + 50\% \text{ of CO attainment level in end semester examination.}$$

The overall COs attainment level can be obtained for all the courses of the program in a similar manner.

Attainment of POs:

The overall attainment level of POs is based on the values obtained using direct and indirect methods in the ratio of 80:20. The direct attainment of POs is obtained through the attainment of COs. The overall CO attainment value as estimated above and CO-PO mapping value as shown in **Table 3** are used to compute the attainment of POs. PO attainment values obtained using direct method can be written as shown in **the following Table.**

PO Attainment Values using Direct Method

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-101											
B-GEO-102											
B-GEO-103											
B-GEO-201											
B-GEO-202											
B-GEO-203											
B-GEO-301											
B-GEO-302											
B-GEO-303											
B-GEO-401											
B-GEO-402											
B-GEO-403											
B-GEO-SEC-404											
B-GEO-SEC-405											
B-GEO-DSE-501											
B-GEO-DSE-502											
B-GEO-DSE-503											
B-GEO-DSE-504											
B-GEO-DSE-505											
B-GEO-DSE-506											
B-GEO-DSE-507											
B--GE-508*											
B--GE-509*											
B-GEO-DSE-601											
B-GEO-DSE-602											
B-GEO-DSE-603											
B-GEO-DSE-604											
B-GEO-DSE-605											
B-GEO-DSE-606											
B--GE-608*											
B--GE-609*											
Direct PO attainment	Average of above values	Average of above values	Average of above values	--	--	--	--	--	--	--	Average of above values

* Code will be decided as per the choice of student from the group of generic electives.

The PO attainment values to be filled in above table can be obtained as follows:

For B-GEO-101-PO1 Cell:

PO1 attainment value = (Mapping factor of **B-GEO-101**-PO1 from **Table 3** × Overall CO attainment value for the course **B-GEO-101**)/3

For B-GEO-201-PO1 Cell:

PO1 attainment value = (Mapping factor of **B-GEO-201**-PO1 from **Table 3** × Overall CO attainment value for the course **B-GEO-201**)/3

Similarly, values for each cell of the above table can be obtained. The direct attainment of POs is average of individual PO attainment values.

In order to obtain the PO attainment using indirect method, a student exit survey based on the questionnaire of POs may be conducted at end of last semester of the program. The format for the same is given in the following table. Average of the responses from the outgoing students for each PO is estimated.

The overall PO attainment values are obtained by adding attainment values estimated using direct and indirect methods in the proportion of 80:20 as follows:

Overall attainment value for PO1 = $0.8 \times$ average attainment value for PO1 using direct method (**from above table**) + $0.2 \times$ average response of outgoing students for PO1. Similarly, overall attainment value can be obtained for each PO.

Questionnaire for indirect measurement of PO attainment(For outgoing students)

At the end of my degree program I am able to do:

	Please tick any one		
Statement of PO1	3	2	1
Statement of PO2	3	2	1
Statement of PO3	3	2	1
Statement of PO4	3	2	1
Statement of PO5	3	2	1
Statement of PO6	3	2	1
Statement of PO7	3	2	1
Statement of PO8	3	2	1
Statement of PO9	3	2	1
Statement of PO10	3	2	1
Statement of PO11	3	2	1
3: Strongly Agree; 2: Agree; 1: Average			

Overall PO attainment values can be written as shown **in the following Table**.

Overall PO attainment Values

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Direct PO attainment											
Indirect PO attainment											
Overall PO attainment											
Target	2	2	2	2	2	1.5	2	2	2	2	1.5

The overall PO attainment values obtained above are compared with set target. The set target for each PO may be different and can be finalized by the staff councils of the departments/institutes. If overall PO attainment value is less than the set target value then an action plan may be prepared for improvement in the subsequent academic session.

The overall PSO attainment level based on CO-PSO mapping values and overall CO attainment values can be obtained in a similar manner.

Annexure-II

Kurukshetra University, Kurukshetra
(Established by the State Legislature Act XII of 1956)
(‘A+’ Grade, NAAC Accredited)

॥ योगस्थः कुरु कर्माणि ॥
समबुद्धिं व योग युक्त होकर कर्म करो

(Perform Actions while Stead fasting in the State of Yoga)



DEPARTMENT OF GEOGRAPHY

CBCS CURRICULUM (2020 -21)
Program Name: B.Sc.with Geography
(For the Batches Admitted From 2020-2021)

OUTCOME BASEDEDUCATION SYSTEM

CBCS CURRICULUM (2020-21)
Program Name: B. Sc. with Geography
(For the Batches Admitted From 2020-2021)

VISION

Be globally acknowledged as a distinguished centre of academic excellence.

MISSION

To prepare a class of proficient scholars and professionals with ingrained human values
and commitment to expand the frontiers
of knowledge for the advancement of society.

DEPARTMENT VISION AND MISSION

VISION

- To become a model department as a Centre of quality education, research with innovation and recognition at National and International level for serving the society.

MISSION

- **M1:** To provide quality education to aspiring young minds for improving their skills, inculcating values, creating leadership qualities and enhance research with innovative methods.
- **M2:** To produce young geographers who would contribute in the areas of higher education, regional and national planning, development, environment, ethics and sustainable environment development.
- **M3:** To develop Teaching-Learning methods which can produce socially committed professionals who contribute effectively in nation building.

Mapping of University Vision and Mission to Department Vision and Mission

Acclaimed as modal Centre of Learning and Research by

University Vision and Mission	Department Vision and Mission
High quality knowledge delivery through state of art infrastructure and ethical values to the students	Yes
Students excellence will make them professionals and innovators emerging as national and global leaders	Yes
Research and development will help in furtherance of faculty knowledge	Yes

Program Outcomes (PO) with Graduate Attributes

Programme outcomes are attributes of the graduates from the programme that are indicative of the graduates' ability and competence to work after being a qualified professional geographer upon graduation. Program outcomes are statements that describe what students are expected to know or do by the time of graduation, they must relate to knowledge and skills that the students acquire from the programme. The achievement of all outcomes indicates that the student is well prepared to achieve the program educational objectives down the road. The department of geography has the following eleven PO's. The course syllabi and the overall curriculum have been designed to achieve these outcomes:

Program Outcomes (PO) for Under Graduate Programmes (CBCS) in the Faculty of Sciences, Kurukshetra University, Kurukshetra

PO1	Knowledge	Capable of demonstrating comprehensive disciplinary knowledge gained during course of study
PO2	Communication	Ability to communicate effectively on general and scientific topics with the scientific community and with society at large
PO3	Problem Solving	Capability of applying knowledge to solve scientific and other problems
PO4	Individual and Team Work	Capable to learn and work effectively as an individual, and as a member or leader in diverse teams, in multidisciplinary settings.
PO5	Investigation of Problems	Ability of critical thinking, analytical reasoning and research-based knowledge including design of experiments, analysis and interpretation of data to provide conclusions
PO6	Modern Tool usage	Ability to use and learn techniques, skills and modern tools for scientific practices
PO7	Science and Society	Ability to apply reasoning to assess the different issues related to society and the consequent responsibilities relevant to the professional scientific practices
PO8	Life-Long Learning	Aptitude to apply knowledge and skills that are necessary for participating in learning activities throughout the life
PO9	Environment and Sustainability	Ability to design and develop modern systems which are environmentally sensitive and to understand the importance of sustainable development.
PO10	Ethics	Apply ethical principles and professional responsibilities in scientific practices
PO11	Project Management	Ability to demonstrate knowledge and understanding of the scientific principles and apply these to manage projects

Program Specific Outcomes (PSO's):

- **PSO1:** Basic understanding of fundamental concepts of geography as an earth science.
- **PSO2:** Clearly formulate and solve real life challenges with respect to human environment interactions.
- **PSO3:** Applications of fundamental principles of geography for the betterment of human society.
- **PSO4:** Acquisition of skills to effectively communicate the knowledge of geography to the society for safe guarding the physical environment.

Kurukshetra University Kurukshetra
Scheme of Examination and Syllabus for B.Sc.
under Choice Based Credit System w.e.f. 2020-21 in phased manner

Subject: Geography

Semester	Course	Course Code	Nomenclature of the Paper	Credits	Hours/ week	Marks			Duration of Exam.
						Ext.	Int.	Total	
I	Core Course (CC)-I (Geography)	B-GEO-101	Geography of India	3	3	60	15	75	3 Hours
		B-GEO-102	Geography of Haryana	3	3	60	15	75	3 Hours
		B-GEO-103	Maps and scales (Practical)	2	4	40	10	50	3 Hours
II	Core Course (CC)-II (Geography)	B-GEO-201	Physical Geography- I	3	3	60	15	75	3 Hours
		B-GEO-202	Human Geography- I	3	3	60	15	75	3 Hours
		B-GEO-203	Representation of Physical Features (Practical)	2	4	40	10	50	3 Hours
III	Core Course (CC)-III (Geography)	B-GEO-301	Physical Geography-II	3	3	60	15	75	3 Hours
		B-GEO-302	Human Geography -II	3	3	60	15	75	3 Hours
		B-GEO-303	Representation of Climatic Data (Practical)	2	4	40	10	50	3 Hours
IV	Core Course (CC)-IV(Geography)	B-GEO-401	Economic Geography	3	3	60	15	75	3 Hours
		B-GEO-402	Statistical methods in Geography	3	3	60	15	75	3 Hours
		B-GEO-403	Maps and Diagrams (Practical)	2	4	40	10	50	3 Hours
	Skill Enhancement Course (SEC) (Geography)	B-GEO-SEC-404	Map Reading and Interpretation	2	2	40	10	50	2½ Hours
		OR							2½ Hours
V	Discipline Specific Elective (DSE)-A(Geography)	B-GEO-DSE-501	Agricultural Geography	2	2	40	10	50	2½ Hours
		OR							2½ Hours
		B-GEO-DSE-502	Resource Geography	2	2	40	10	50	2½ Hours
		B-GEO-DSE-503	Settlement Geography						2½ Hours
		OR		2	4	40	10	50	2½ Hours
		B-GEO-DSE-504	Transport Geography						3 Hours
		B-GEO-DSE-505	Map Projections (Practical)	2	4	40	10	50	3 Hours
		OR							3 Hours
		B-GEO-DSE-506	Socio-economic Field Survey (Practical)	OR					
B-GEO-DSE-507	*MOOC course from Swayam Portal	**	**			**			
VI	Discipline Specific Elective (DSE)-B (Geography)	B-GEO-DSE-601	Fundamentals of Remote Sensing	2	2	40	10	50	2½ Hours
		OR							2½ Hours
		B-GEO-DSE-602	Introduction to Geo-spatial Technology	2	2	40	10	50		2½ Hours
		B-GEO-DSE-603	Geography of Asia						2	4	40	10	50	3 Hours
		OR		2	4	40	10	50						3 Hours
		B-GEO-DSE-604	Geography of Europe						2	4	40	10	50	3 Hours
		B-GEO-DSE-605	Elementary Remote Sensing (Practical)	2	4	40	10	50						3 Hours
		OR							2
		B-GEO-DSE-606	Physical Field Survey (Practical)	2	4	40	10	50						3 Hours
Total			46						58	920	230	1150

Note: Ext. = External Assessment Marks
Ent. = Internal Assessment Marks

Semester-I
Core Course Code: B-GEO-101
Core Course Name: Geography of India

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course Outcomes (COs):

- B-GEO-101.1:** Provides understanding about the physical structure of India.
B-GEO-101.2: Enrichment of understanding about the human resource endowment.
B-GEO-101.3: Acquaintance with geographical distribution of major resources.
B-GEO-101.4: Enhancement of knowledge about spatial distribution of industries, transport and communication.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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- I

1. Introduction: location, relief structure and drainage systems.
2. Bio-climatic environment: Climate, soils and natural vegetation.

UNIT-II

3. Population: distribution, density and growth.
4. Human habitats: types of human settlements and levels of urbanization.

UNIT-III

5. Agriculture: land resources, irrigation, cropping pattern and Green Revolution.
6. Energy and mineral resources: coal, petroleum, hydropower, iron ore, manganese and mica.

UNIT-IV

7. Industries: iron and steel, cotton textile, sugar and industrial regions of India.
8. Transport and trade: modes of transport, international trade.

Suggested Readings:

1. Deshpande, C D: India-A Regional Interpretation, Northern Book Depot, New Delhi, 1992.
2. Hussain Majid (2015): Geography of India, Mc Graw Hill Education.
3. Singh, Gopal: Geography of India, Atma Ram and Sons, 2006.
4. Shafi, M: Geography of South Asia, McMillan and Company, Calcutta, 2000.
5. Singh, R L (ed): India: A Regional Geography, National Geographical Society, India, Varanasi, 1971.
6. Spate, O H K and ATA Learmonth: Indian and Pakistan-Land, People and Economy, Methuen and Company, London, 1967.

Mapping of Course Outcomes to Program Outcomes (Geography of India)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-101.1	3.0	3.0	1.0	1.0	2.0	1.0	2.0	3.0	3.0	1.0	2.0
B-GEO-101.2	3.0	3.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	3.0
B-GEO-101.3	3.0	2.0	2.0	1.0	3.0	1.0	2.0	3.0	3.0	1.0	2.0
B-GEO-101.4	3.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	2.0	1.0	2.0
Average	3.0	2.5	1.8	1.5	2.5	1.3	2.5	3.0	2.8	1.3	2.3

Mapping of Course Outcomes to Program Specific Outcomes (Geography of India)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-101.1	3.0	2.0	3.0	2.0
B-GEO-101.2	3.0	3.0	3.0	3.0
B-GEO-101.3	3.0	2.0	3.0	2.0
B-GEO-101.4	3.0	3.0	3.0	2.0
Average	3.0	2.5	3.0	2.5

Semester-I
Core Course Code: B-GEO-102
Core Course Name: Geography of Haryana

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-102.1:** Provide understanding about the bio physical environment of Haryana.
B-GEO-102.1: Enhancement of knowledge about population distribution and agricultural pattern.
B-GEO-102.1: Enrichment of knowledge about spatial distribution of industries, transport and communication.
B-GEO-102.1: Acquaintance with regional diversities and structure.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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- I

1. Introduction: administrative divisions, geographical personality and relief.
2. Bio physical environment: drainage, climate, soils and vegetation.

UNIT- II

3. Population: distribution, density, growth and settlements.
4. Agriculture: land use and cropping pattern, irrigation and problems of agriculture.

UNIT-III

5. Industry: distribution and pattern of major industries and industrial regions.
6. Transportation: modes of transportation and communication.

UNIT-IV

7. Geographical regions: Ahirwal, Mewat, Khadar and Bagar.
8. Regional diversities: environmental, economic and socio-cultural diversities.

Suggested Readings:

1. Census of India. 1981. Regional Division in Haryana.
2. Census of India. 2001. Administrative Atlas of Haryana.
3. Chaudhary, D.R. 2009. Haryana at Crossroads: problems and prospects. National Book Trust of India, New Delhi.
4. Singh, J. 1976. Agricultural Geography of Haryana, Vishal Publication, Kurukshetra.
5. Singh, R.L. 1971. India- A Regional Geography. National Geographical Society of India, Varanasi.
6. Verma, D.C. and Singh, S. 2001. Haryana-The Land and People. National Book Trust of India, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Geography of Haryana)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-102.1	3.0	3.0	2.0	1.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-102.2	3.0	3.0	3.0	2.0	3.0	2.0	2.0	3.0	3.0	1.0	2.0
B-GEO-102.3	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	1.0	3.0
B-GEO-102.4	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
Average	3.0	3.0	2.5	1.8	3.0	1.8	2.5	3.0	2.8	1.5	2.5

Mapping of Course Outcomes to Program Specific Outcomes (Geography of Haryana)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-102.1	3.0	3.0	2.0	3.0
B-GEO-102.2	3.0	3.0	2.0	2.0
B-GEO-102.3	3.0	3.0	3.0	2.0
B-GEO-102.4	3.0	3.0	3.0	3.0
Average	3.0	3.0	2.5	2.5

Semester-I
Core Course Code: B-GEO-103
Core Course Name: Maps and Scales (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-103.1:** Knowledge about cartographic skills.
B-GEO-103.2: Provides understanding about map scales.
B-GEO-103.3: Measurement skills of distances and areas on maps.
B-GEO-103.4: Enhancement of knowledge about enlargement and reduction of maps.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise = 24 File Record = 08 Viva-voce = 08

1. Introduction to Cartography.
2. Maps and their types.
3. Map Scales.
 - (i) Methods of Expressing a scale 2 exercise
 - (ii) Conversion of Statement of Scale into R.F. and vice-versa. 1 exercise
 - (iii) Plain Scale (km and mile) 1 exercise
 - (iv) Comparative Scale 2 exercise
 - (v) Diagonal Scale 2 exercise
4. Measurement of Distances and Areas on Maps 2 exercise
5. Enlargement and Reduction of Maps 2 exercise

Suggested Readings:

1. F.J. Monkhouse and H.R. Wilkinson (1972) Maps and Diagrams, Methuen and Co. Ltd., London
2. L.R. Singh and Raghuvander Singh (1973), Map Work and Practical Geography, Central Book Depot, Allahabad.
3. R.L. Singh and P.K. Dutt (1968), Elements of Practical Geography, Students Friends, Allahabad.
4. Singh Gopal (2004). Map Work and Practical Geography, Vikas Publication House.

Mapping of Course Outcomes to Program Outcomes (Maps and Scales-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-103.1	3.0	1.0	1.0	1.0	1.0	2.0	1.0	3.0	1.0	1.0	1.0
B-GEO-103.2	3.0	2.0	1.0	1.0	2.0	3.0	2.0	3.0	1.0	1.0	2.0
B-GEO-103.3	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	1.0	1.0	3.0
B-GEO-103.4	3.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	1.0	2.0	3.0
Average	3.0	2.0	1.5	1.5	2.3	2.8	2.0	3.0	1.0	1.3	2.3

Mapping of Course Outcomes to Program Specific Outcomes (Maps and Scales-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-103.1	3.0	1.0	2.0	1.0
B-GEO-103.2	3.0	1.0	3.0	2.0
B-GEO-103.3	3.0	2.0	3.0	2.0
B-GEO-103.4	3.0	3.0	3.0	3.0
Average	3.0	1.8	2.8	2.0

Semester-II
Core Course Code: B-GEO-201
Core Course Name: Physical Geography-I

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-201.1:** Provides knowledge about the basics of physical geography
B-GEO-201.2: Enrichment of knowledge about tectonic activities.
B-GEO-201.3: Enhancement of knowledge about processes controlling weathering and mass movement
B-GEO-201.4: Provides ability to understand the processes and patterns of erosion.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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-I

1. Definition, nature, scope and fields of physical geography.
2. Interior of the earth, geological time scale and rocks.

UNIT-II

3. Earth movements; earth quakes and volcanoes.
4. Wegner's theory of continental drift and Plate tectonic theory.

UNIT-III

5. Weathering; causes and its types.
6. Mass-movements; causes, its types and impacts.

UNIT-IV

7. Concept of cycle of erosion
8. Landforms: wind, river, underground water and glaciers

Suggested Readings:

1. Bloom A.L. 1998. Geomorphology-A Systematic Analysis of Late Cenozoic Landforms. Prentice Hall of India, New Delhi, India.
2. Sharma H.S. Perspective in Geomorphology, Concept, New Delhi 1980.
3. Singh Savinder, Geomorphology, Prayag Publication, Allahabad 1998.
4. Singh Savinder, Physical Geography Prayag Publication, Allahabad, 1998.
5. Sparks B.W. Geomorphology, Longman, London, 1960.
6. Thornbury W.D. 1969 Principles of Geomorphology, New York, John Wiley & Sons.

Mapping of Course Outcomes to Program Outcomes (Physical Geography-I)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-201.1	3.0	2.0	2.0	1.0	3.0	2.0	2.0	3.0	3.0	1.0	1.0
B-GEO-201.2	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0
B-GEO-201.3	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0
B-GEO-201.4	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0
Average	3.0	2.8	2.8	2.3	3.0	2.3	2.8	3.0	3.0	1.8	2.5

Mapping of Course Outcomes to Program Specific Outcomes(Physical Geography-I)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-201.1	3.0	2.0	1.0	1.0
B-GEO-201.2	3.0	3.0	3.0	3.0
B-GEO-201.3	3.0	3.0	3.0	3.0
B-GEO-201.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.5	2.5

Semester-II
Core Course Code: B-GEO-202
Core Course Name: Human Geography-I

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-202.1:** Provides knowledge about the fundamentals of human geography.
B-GEO-202.2: Enrichment of knowledge about distribution of races and tribes in the world.
B-GEO-202.3: Acquaint with religions and their distribution in the world.
B-GEO-202.4: Familiarization with different languages of the world and their geographical distribution.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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-I

1. Nature and scope of human geography, branches of human geography.
2. Human-environment relationship: environmental determinism, possibilism and ecological approach.

UNIT – II

3. Human race: Meaning, classification of races and their global diffusion and distribution.
4. Tribe: Definition, classification and global distribution; environmental adaptation by Eskimo, Bushman, Gonds and Gujjars.

UNIT – III

5. Religion: Meaning, nature, classification and evolution.
6. Geographical distribution of religions: Christianity, Islam, Hinduism, Buddhism and Judaism.

UNIT-IV

7. Language and dialects: nature and classification of world languages.
8. Global distribution of major languages: English, Latin, Arabic, Mandarin and Hindi.

Suggested Readings:

1. Agarwal, A et al: The Citizen's Fifth Citizen's Report, Centre for Science & Environment, New Delhi, 1999.
2. Alexander, John. W.: Economic Geography, Prentice Hall of India Ltd., New Delhi, 1988.
3. Bergwan, Edward E: Human Geography: Culture Connections and Landscape, Prentice-Hall, New Jersey, 1985.
4. Carr, M. Patterns: Process and Change in Human Geography, McMillan Education, London, 1987.
5. Chandna, R.C.: A Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi, 1986.
6. DeBlij, H. J.: Human Geography, Culture, Society and Space, John Wiley, New York, 1996.
7. Fellman, J.L.: Human Geography-Landscapes of Human Activities, Brown and Benchmark Pub., USA, 1997.
8. Hussain, M. Human Geography, Rawat, Publication, Jaipur, 2018.
9. McBride, P.J.: Human Geography; Systems Patterns and Change, Nelson, UK and Canada, 1996.
10. Michael, C.: New Patterns: Process and Change in Human Geography, Nelson, 1996.
11. Singh, N.A Text Book of Human Geography, Rajesh Publishing, 2015.
12. Sharma, Y.K. Human geography, Narain publishers, 2017.

Mapping of Course Outcomes to Program Outcomes (Human Geography-I)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-202.1	3.0	2.0	1.0	1.0	2.0	1.0	1.0	3.0	2.0	1.0	1.0
B-GEO-202.2	3.0	3.0	2.0	1.0	3.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-202.3	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-202.4	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	2.0	2.0
Average	3.0	2.8	1.8	1.5	2.8	1.0	1.5	3.0	2.0	1.8	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Human Geography-I)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-202.1	3.0	2.0	2.0	1.0
B-GEO-202.2	3.0	2.0	3.0	3.0
B-GEO-202.3	3.0	2.0	3.0	3.0
B-GEO-202.4	3.0	2.0	3.0	3.0
Average	3.0	2.0	2.8	2.5

Semester-II
Core Course Code: B-GEO-203
Core Course Name: Representation of Physical Features (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-203.1:** Knowledge about different types of topographical maps.
B-GEO-203.2: Provides understanding about methods of relief representation.
B-GEO-203.3: Enhancement of skills of relief representation.
B-GEO-203.4: Knowledge of drawing of landform profiles.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise	= 24	File Record	= 08	Viva-voce	= 08
1.	Introduction to Topographical Sheets India and adjacent countries Degree Sheet Half Degree Sheet Quarter Degree Sheet Conventional Signs			3 exercise	
2.	Methods of representing relief			1 exercise	
3.	Representation of Topographical features by contours. Slopes (Concave, convex, undulating and terraced) Valleys (V Shaped, U shaped, Gorge, Re-entrant) Ridges (Conical hill, Volcanic hill, Plateau, Escarpment) Complex features (waterfall, sea cliff, overhanging cliff, Fiord coast)			4 exercise	
4.	Drawing of Profiles (a) Cross Profiles: Serial, superimposed, projected and composite profiles. (b) Longitudinal profiles			5 exercise	

Suggested Readings:

1. F.J. Monkhouse and H.R. Wilkinson (1972) Maps and Diagrams, Methuen and Co. Ltd., London
2. L.R. Singh and Raghuvander Singh (1973), Map Work and Practical Geography, Central Book Depot, Allahabad.
3. R.L. Singh and P.K. Dutt (1968), Elements of Practical Geography, Students Friends, Allahabad.
4. Singh Gopal (2004), Map Work and Practical Geography, Vikas Publication House.

Mapping of Course Outcomes to Program Outcomes (Representation of Physical Features-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-203.1	3.0	2.0	1.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0
B-GEO-203.2	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0
B-GEO-203.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0
B-GEO-203.4	3.0	2.0	3.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0
Average	3.0	2.5	2.5	2.5	2.8	2.3	2.3	3.0	1.8	2.0	3.0

Mapping of Course Outcomes to Program Specific Outcomes (Representation of Physical Features-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-203.1	3.0	2.0	3.0	3.0
B-GEO-203.2	3.0	3.0	3.0	3.0
B-GEO-203.3	3.0	3.0	3.0	3.0
B-GEO-203.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	3.0	3.0

Semester-III
Core Course Code: B-GEO-301
Core Course Name: Physical Geography-II

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-301.1:** Provides knowledge about the basics of climatology and oceanography.
B-GEO-301.2: Enrichment of knowledge about atmospheric circulation and humidity.
B-GEO-301.3: Augmentation of knowledge about weather disturbances.
B-GEO-301.4: Familiarization with the oceanic floor and circulation.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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-I

1. Weather and Climate; composition and structure of atmosphere.
2. Global heat budget and distribution of temperature.

UNIT-II

3. Atmospheric pressure: distribution, pressure belts, planetary winds and monsoon.
4. Humidity: measurement and variables, processes of evaporation, condensation and precipitation.

UNIT-III

5. Air masses and fronts: classification, types and their characteristics.
6. Weather disturbances: tropical and extra-tropical cyclones.

UNIT-IV

7. Oceanic relief: Pacific, Atlantic and Indian Oceans.
8. Distribution of salinity and oceanic circulation (tides and currents)

Suggested Readings:

1. Barry, RG and Chorley R.J., Atmosphere, Weather and Climate, Routledge, 1998.
2. Critchfield, H., General Climatology, Prentice-Hall of India, 2002.
3. King, C. Oceanography for Geographers, Edward Arnold, London, 1975.
4. Trewartha, GT: An Introduction to Climate, Mc-Graw Hill, New York, 1981.
5. Trewartha, G.T., The Earth's Problems Climates, University of Wisconsin Press, USA.

Mapping of Course Outcomes to Program Outcomes (Physical Geography-II)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-301.1	3.0	3.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-301.2	3.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-301.3	3.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-301.4	3.0	3.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0
Average	3.0	3.0	2.0	2.0	1.5	1.0	2.0	3.0	2.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Physical Geography-II)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-301.1	3.0	1.0	1.0	3.0
B-GEO-301.2	3.0	1.0	1.0	3.0
B-GEO-301.3	3.0	1.0	1.0	3.0
B-GEO-301.4	3.0	1.0	1.0	3.0
Average	3.0	1.0	1.0	3.0

Semester-III
Core Course Code: B-GEO-302
Core Course Name: Human Geography-II

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-302.1:** Provides awareness about the population distribution and density.
B-GEO-302.2: Augmentation of knowledge about the growth, fertility and mortality rates.
B-GEO-302.3: Familiarization with age and sex composition of population and literacy rates
B-GEO-302.4: Development of ability to understand the process of urbanization and its impacts.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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- I

1. Distribution and determinants of world population
2. Density of population: meaning, types, world pattern and temporal change.

UNIT- II

3. Growth rate of population: world pattern and trends.
4. Fertility and mortality rates: world pattern and determinants

UNIT- III

5. Age and sex composition of world population; comparison of developed and developing countries.
6. Literacy: Definition, world pattern of literacy rate, its determinants and impacts.

UNIT- IV

7. Urban settlements: origin, classification and functions of towns.
8. Urbanization pattern in the world; determinants and impacts of urbanization.

Suggested Readings:

1. Agarwal, A et al: The Citizen's Fifth Citizen's Report, Centre for Science & Environment, New Delhi, 1999.
2. Alexander, John. W.: Economic Geography, Prentice Hall of India Ltd., New Delhi, 1988.
3. Bergwan, Edward E: Human Geography: Culture Connections and Landscape, Prentice-Hall, New Jersey, 1985.
4. Carr, M. Patterns: Process and Change in Human Geography, McMillan Education, London, 1987.
5. Carter, H.: The study of Urban Geography, Edward Arnold, London, 1972.
6. Chandna, R.C.: A Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi, 2016.
7. DeBlij, H. J.: Human Geography, Culture, Society and Space, John Wiley, New York, 1996.
8. Fellman, J.L.: Human Geography-Landscapes of Human Activities, Brown and Benchman Pub., USA, 1997.
9. Hassan, I: Population Geography: A Systematic Exposition, Routledge, London.
10. McBride, P.J.: Human Geography; Systems Patterns and Change, Nelson, UK and Canada, 1996.
11. Michael, C.: New Patterns: Process and Change in Human Geography, Nelson, 1996.
12. Qazi, S.A.: Population Geography, APH publishers, 2010.
13. Ramachandra, R.: Urbanization and Urban System in India, Oxford, London, 1992.

Mapping of Course Outcomes to Program Outcomes (Human Geography-II)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-302.1	3.0	3.0	2.0	3.0	1.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-302.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0
B-GEO-302.3	3.0	2.0	2.0	3.0	2.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-302.4	3.0	3.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	2.0	2.0
Average	3.0	2.8	2.3	2.8	1.8	1.5	2.3	3.0	2.0	2.0	2.3

Mapping of Course Outcomes to Program Specific Outcomes (Human Geography-II)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-302.1	3.0	3.0	3.0	3.0
B-GEO-302.2	3.0	3.0	3.0	3.0
B-GEO-302.3	3.0	3.0	3.0	3.0
B-GEO-302.4	3.0	3.0	3.0	3.0
Average	3.0	3.0	3.0	3.0

Semester-III
Core Course Code: B-GEO-303
Core Course Name: Representation of Climatic Data (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-303.1:** Capability of measurement of climatic data.
B-GEO-303.2: Ability to represent the temperature and rainfall data.
B-GEO-303.3: Development of skill to read and interpret the weather maps.
B-GEO-303.4: Acquaintance with skills of chain and tape survey.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise	= 24	File Record	= 08	Viva-voce	= 08
1. Measurement of temperature, rainfall, pressure and humidity.					
2. Representation of temperature and rainfall.					
(i) Line and Bar Graph				1 exercise	
(ii) Distribution of temperature				1 exercise	
(iii) Distribution of rainfall				1 Exercise.	
(iv) Hythergraph				1 exercise.	
(v) Rainfall deviation diagram				1 exercise.	
3. Climograph (wet and dry places)				2 exercise.	
4. Distribution of pressure				2 Exercise.	
5. Weather map Interpretation (January & July)				2 exercise.	
6. Chain and tape survey				2 Exercise.	

Suggested Readings

- Khan, A.A. 1996. Text Book of Practical Geography, Concept, New Delhi.
- Lawrence, GRP. 1968. Cartographic Methods, Methuen, London.
- Monkhouse, F.J. and Wilkinson, H.R. 1994. Maps and Diagrams, Methuen, London.
- Mishra R.P. and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
- Robinson, A.H. et.al. Elements of Cartography, John Wiley & Sons, 1995.
- Singh, R.L., 1979. Elements of Practical Geography, Kalyani Publisher, New Delhi.
- Sarkar, A.K 1997: Practical Geography-A Systematic Approach, Orient Longman, Calcutta.

Mapping of Course Outcomes to Program Outcomes (Representation of Climatic Data-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-303.1	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
B-GEO-303.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
B-GEO-303.3	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
B-GEO-303.4	3.0	2.0	1.0	3.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0
Average	3.0	2.8	2.0	2.3	1.8	2.0	1.8	2.5	1.8	1.8	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Representation of Climatic Data-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-303.1	3.0	2.0	2.0	3.0
B-GEO-303.2	3.0	3.0	3.0	3.0
B-GEO-303.3	3.0	3.0	3.0	3.0
B-GEO-303.4	2.0	2.0	2.0	2.0
Average	2.8	2.5	2.5	2.8

Semester-IV
Core Course Code: B-GEO-401
Core Course Name: Economic Geography

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-401.1:** Provides knowledge about the fundamental concepts of economic geography.
B-GEO-401.2: Acquisition of knowledge about resources and their conservation.
B-GEO-401.3: Enrichment of knowledge about distribution of crops, minerals and energy resources.
B-GEO-401.4: Acquaintance with global industries, transport, communication and trade.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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- I

1. Nature and scope of economic geography and its relationship with economics.
2. Classification of economic activities and their impact on environment.

UNIT- II

3. Natural resources: types, bases of classification.
4. Utilization and conservation of natural resources.

UNIT- III

5. World distribution of food crops (rice and wheat), commercial crops (cotton and sugarcane) and plantation crops (tea and coffee).
6. World distribution and production of coal, petroleum and natural gas, iron ore and bauxite

UNIT- IV

7. World distribution and production of iron and steel industry, textile industry, sugar industry and automobile industry.
8. Transport, communication and trade: geographical factors in their development, major modes of water, land and air transport, recent trends in international trade.

Suggested Readings:

1. Gautam, A. 2010. Advanced Economic Geography. Sharda Pustak Bhawan, Allahabad.
2. Hartshorne, T. A. and Alexander, J. W. 2001. Economic Geography. Prentice Hall of India. New Delhi.
3. Hudson, R. 2005. Economic Geography. Sage Publication, New Delhi.
4. Jones, C. F. and Drakenwarld, G. G. Economic Geography. The Macmillan and Company. New York.
5. Knowled, R. and Wareing, J. 1992. Economic and Social Geography. Rupa and Company, Calcutta.
6. Knox, P. 2003. The Geography of World Economy. Arnold, London.
7. Saxena, H.M. 2013. Economic Geography. Rawat Publications, Jaipur.
8. Thomas, RS. 1962. The Geography of Economic Activities. McGraw Hill, New York.
9. Wheeler, J.O. and Muller, P.O. 1995. Economic Geography. John Wiley and Sons. New York.

Mapping of Course Outcomes to Program Outcomes (Economic Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-401.1	3.0	2.0	1.0	1.0	1.0	1.0	1.0	3.0	2.0	2.0	2.0
B-GEO-401.2	3.0	3.0	3.0	2.0	1.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-401.3	3.0	2.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-401.4	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
Average	3.0	2.5	2.0	1.8	1.5	1.3	1.8	3.0	2.0	2.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Economic Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-401.1	2.0	1.0	2.0	1.0
B-GEO-401.2	3.0	3.0	3.0	3.0
B-GEO-401.3	3.0	2.0	3.0	3.0
B-GEO-401.4	3.0	2.0	3.0	3.0
Average	2.8	2.0	2.8	2.5

Semester-IV
Core Course Code: B-GEO-402
Core Course Name: Statistical Methods in Geography

Time: 3 Hours
Credits: 3

Total Marks : 75
External Assessment Marks : 60
Internal Assessment Marks : 15

Course outcomes (COs):

- B-GEO-402.1:** Development of capability to understand the basics of statistics.
B-GEO-402.2: Capability to comprehend the methods of central tendencies and dispersion.
B-GEO-402.3: Awareness about various tools of inequality analysis.
B-GEO-402.4: Understanding the use of bivariate analysis in geography.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two 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- I

1. Descriptive statistics: visual descriptive methods, histograms, frequency curve.
2. Measures of central tendency and partition values.

UNIT-II

3. Measure of dispersion: quartile deviation, mean deviation and standard deviation.
4. Probability distribution and normal curve.

UNIT-III

5. Sampling: types of sampling and its applications in geographical studies.
6. Inferential statistics: confidence intervals and hypothesis testing.

UNIT-IV

7. Measures of inequality: Loren curve, Gini's coefficient.
8. Bivariate analysis: scatter diagram, correlation (Spearman's rank correlation).

Suggested Readings:

1. Ashis Sarkar (2013), Quantitative Geography: Techniques and Presentations.
2. Gregory S. 1963. Statistical Methods and the Geography, Longman, London.
3. Mahmood. A. (1993): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
4. Rogerson. P.A. (2010), Statistical Methods for Geography, Sage Publication, New Delhi
5. Paul. S.K. (1998): Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Statistical Methods in Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-402.1	3.0	2.0	2.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	1.0
B-GEO-402.2	3.0	2.0	2.0	1.0	2.0	2.0	1.0	3.0	2.0	1.0	1.0
B-GEO-402.3	3.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	1.0
B-GEO-402.4	3.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	1.0	1.0
Average	3.0	2.0	2.0	1.5	1.8	2.0	1.5	2.8	2.5	1.0	1.0

Mapping of Course Outcomes to Program Specific Outcomes (Statistical Methods in Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-402.1	3.0	2.0	2.0	2.0
B-GEO-402.2	3.0	2.0	2.0	2.0
B-GEO-402.3	3.0	3.0	3.0	3.0
B-GEO-402.4	3.0	2.0	2.0	2.0
Average	3.0	2.3	2.3	2.3

Semester-IV
Core Course Code: B-GEO-403
Core Course Name: Maps and Diagrams (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-403.1:** Knowledge about different types of thematic maps.
B-GEO-403.2: Skill acquisition for construction of qualitative distribution maps.
B-GEO-403.3: Ability to construct quantitative thematic maps.
B-GEO-403.4: Capability to carry out prismatic compass survey.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise	= 24	File Record	= 08	Viva-voce	= 08
1. Principal of map design and layout					
2. Symbolization: point, line and area symbol					
3. Lettering and toponomy					
4. Mechanics of map construction					
5. Distribution maps					
(i) Qualitative distribution maps					
• Choro schematic maps				1 Exercise	
• Chorochromatic maps				2 Exercise	
(ii) Quantitative distribution Maps					
• Isopleth maps				3 Exercises	
• Choropleth maps				3 Exercises	
• Dot maps				3 Exercises	
• Diagrammatic maps				3 Exercises.	
6. Prismatic Compass Survey				2 Exercises.	

Suggested readings:

1. Mishra RP and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
2. Monkhouse FJ and Wilkinson HR. 1972. Maps and Diagrams, Methuen Press, London
3. Singh Gopal. 2004. Map Work and Practical Geography, Vikas Publication House, New Delhi.
4. Singh RL. 1979. Elements of Practical Geography, Kalyani Publishers, New Delhi

Mapping of Course Outcomes to Program Outcomes (Maps and Diagrams-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-403.1	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
B-GEO-403.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO-403.3	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO-403.4	3.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Average	3.0	2.5	2.5	2.0	2.0	2.0	2.0	2.5	2.0	1.3	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Maps and Diagrams-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-403.1	3.0	2.0	2.0	2.0
B-GEO-403.2	3.0	2.0	2.0	2.0
B-GEO-403.3	3.0	2.0	2.0	2.0
B-GEO-403.4	3.0	1.0	1.0	1.0
Average	3.0	1.8	1.8	1.8

Semester-IV
Skill Enhancement Course Code: B-GEO- SEC-404
Skill Enhancement Course Name: Map Reading and Interpretation

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO- SEC-404.1:** Knowledge about fundamentals of map reading.
B-GEO- SEC-404.2: Ability to determine the time at different locations in world.
B-GEO- SEC-404.3: Augmentation of knowledge about topographic features.
B-GEO- SEC-404.4: Development of skills to delineate drainage basin and measurement of height and slope.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Essentials and uses of maps.
2. Types of maps: topographic and thematic maps.
3. Reading of atlas maps.
4. Scales: definition, types and uses.
5. Directions: their measurement and compass bearing.
6. Latitudes and Longitudes: determination of location on maps using CGS and FPS system.
7. GMT and local time (CST, IST, CEST, BST, EST and PST) determination.

UNIT- II

8. Indexing of topographical maps (old and new scheme).
9. Relief features representation on topographic maps: Spot heights, Bench mark, Trigonometrical Points, Contours and Form lines, Hill Shading, Layer Colouring, Hachures.
10. Identification of features on topographic maps: Conical Hill, Plateau, V shaped Valley, U shaped Valley, Cliff, Waterfall, Escarpment, Saddle, Spur.
11. Measurements of height (shadow method).
12. Measurement of slope (clinometer method).
13. Profiles: their types and characteristics.
14. Principles of drainage basin delineation.

Suggested Readings:

1. Mishra RP and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
2. Monkhouse FJ and Wilkinson HR. 1972. Maps and Diagrams, Methuen Press, London
3. Singh Gopal. 2004. Map Work and Practical Geography, Vikas Publication House, New Delhi.
4. Singh RL. 1979. Elements of Practical Geography, Kalyani Publishers, New Delhi

Mapping of Course Outcomes to Program Outcomes (Map Reading and Interpretation)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO- SEC-404.1	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	2.0	2.0	2.0
B-GEO- SEC-404.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0
B-GEO- SEC-404.3	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO- SEC-404.4	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
Average	3.0	3.0	2.8	2.0	2.0	2.0	1.8	2.8	2.0	1.3	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Map Reading and Interpretation)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO- SEC-404.1	3.0	2.0	2.0	2.0
B-GEO- SEC-404.2	3.0	1.0	1.0	1.0
B-GEO- SEC-404.3	3.0	3.0	3.0	3.0
B-GEO- SEC-404.4	3.0	3.0	3.0	3.0
Average	3.0	2.3	2.3	2.3

Semester-IV
Skill Enhancement Course Code: B-GEO-SEC-405
Skill Enhancement Course Name: Introduction to Digital Maps

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-SEC-405.1:** Provides knowledge about reading and interpretation of digital maps.
B-GEO-SEC-405.2: Acquisition of skills about interpretation of satellite weather maps
B-GEO-SEC-405.3: Makes aware about classroom and scanning technology.
B-GEO-SEC-405.4: Understanding about global positioning system and digital navigation maps.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Reading of digital and web maps.
2. Reading and interpretation of satellite weather maps and imageries.
3. Reading and interpretation of photographs and imageries.

UNIT- II

4. Class room technology: white board, online world atlas and magazine maker.
5. Scanning technology: types, significance and applications.
6. Applications of global positioning system and digital navigation maps.

Suggested Readings:

1. Tempfli K et al 2009. Principal of Remote Sensing, ITC Educational Textbook, the Netherland
2. John R. Jensen 2009. Remote Sensing of the Environment-An Earth Resource Perspective, Pearson Education, (India Edition) New Delhi.
3. Lillesand and R.W. Kiefer, 2005. Remote Sensing and Image Interpretation, John Wiley and Sons.

Mapping of Course Outcomes to Program Outcomes (Introduction to Digital Mapping)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-SEC-405.1	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO-SEC-405.2	3.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	1.0	2.0
B-GEO-SEC-405.3	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
B-GEO-SEC-405.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	1.0	2.0
Average	3.0	2.8	2.5	2.3	2.3	2.5	2.3	2.8	2.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Introduction to Digital Mapping)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-SEC-405.1	3.0	3.0	3.0	3.0
B-GEO-SEC-405.2	3.0	3.0	3.0	3.0
B-GEO-SEC-405.3	3.0	1.0	2.0	1.0
B-GEO-SEC-405.4	3.0	3.0	3.0	3.0
Average	3.0	2.5	2.8	2.5

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-501
Discipline Specific Elective Course Name: Agricultural Geography

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-501.1:** Acquittance with the basics of agricultural geography.
B-GEO-DSE-501.2: Ability to understand the determinants of agricultural patterns.
B-GEO-DSE-501.3: Enrichment of knowledge about world agricultural systems.
B-GEO-DSE-501.4: Understanding the skills of measurement of agricultural productivity and food security.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Definition, nature and scope of agricultural geography
2. Physical, technological and institutional factors of agricultural patterns
3. Basis of agricultural regionalization: land use, cropping pattern, crop combination, crop diversification

UNIT- II

4. World agricultural regions based on Whittlesey's criteria.
5. Measurement of agricultural efficiency and productivity
6. Food and nutritional security: availability, accessibility and utilization outcome of food in India

Suggested Readings:

1. Bowler T.R. (1992) The Geography of Agriculture in Developed Market Economics, Longman.
2. Grigg D. (1995) Introduction to Agricultural Geography, Routledge, London.
3. Husain, Majid (1996), Systemic Agricultural Geography Rawat Publications, Jaipur.
4. Singh J. and Dhillon S.S. (1994) Agricultural Geography, Tata Mc Graw Hill, New Delhi.
5. Safi, Mohammad (2007) Agricultural Geography.

Mapping of Course Outcomes to Program Outcomes (Agricultural Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-501.1	3.0	2.0	2.0	3.0	2.0	1.0	3.0	3.0	2.0	2.0	2.0
B-GEO-DSE-501.2	3.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-501.3	3.0	1.0	1.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-501.4	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	1.0	2.0
Average	3.0	1.8	2.0	2.3	2.8	2.3	3.0	3.0	2.5	1.8	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Agricultural Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-501.1	3.0	2.0	3.0	2.0
B-GEO-DSE-501.2	3.0	3.0	2.0	3.0
B-GEO-DSE-501.3	3.0	2.0	3.0	2.0
B-GEO-DSE-501.4	3.0	3.0	2.0	3.0
Average	3.0	2.5	2.5	2.5

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-502
Discipline Specific elective Course Name: Resource Geography

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-502.1:** Acquaintance with the nature and field of resource geography.
B-GEO-DSE-502.2: Provides knowledge about concepts and models of natural resource utilization.
B-GEO-DSE-502.3: Enhancement of knowledge about development and conservation of natural resources.
B-GEO-DSE-502.4: Enrichment of knowledge about policies and problems of resource management in India.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Nature, scope and importance of resource geography.
2. Concepts of resource: exploitation, accumulation, poverty and resource degradation.
3. Models of natural resources process: Zimmermann primitive, Kirk's decision and Brookfield system model.

UNIT- II

4. Relationship between natural resources and development process.
5. Conservation and management methods: Soil, water, forest and mineral resources
6. Policies and problems of natural resource management in India

Suggested Readings:

1. Barbier, Edward B (2005) Natural Resources and Economic Development, Cambridge University Press.
2. Borton, I and R W Kates (1984) Readings in Resource Management and Conservation, University of Chicago Press, Chicago.
3. Bruce, Mitchell (1989) Geography and Resource Analysis, John Wiley and Son, New York.
4. Das Gupta, Biplob (1979) the Environmental Debate, Economic and Political Weekly, Vol.13, No. 6/7, Annual Number (Feb., 1978), pp. 385-387+389+391+393+395+397-400
5. Eliot Hurst, M E (1972) A Geography of Economic Behaviour: An Introduction, Duxbury Press, California.
6. Fabricius, C & Eddie Koch Eds. (2004) Rights, Resources and Rural Development: Community based Natural Resource Management in Southern Africa, Earthscan, London Sterling.
7. Guha, J L and P R Chattroj (1994) Economic Geography- A Study of Resources, The World Press Pvt. Ltd. Calcutta
8. Martino, R L (1969) Resource Management. Mc Graw Hill Book Co., London.
9. Negi, B S (2000) Geography of Resources, Kedar Nath and Ram Nath, Meerut
10. Owen, Oliver, S (1971) Natural Resource Conservation: A Ecological Approach, McMillan, New Delhi.
11. Raja, M (1989) Renewable Resources, Development, Concept Pub. New Delhi.
12. Ramesh, A (1984) Resource Geography (Ed.) R P Misra, Contribution to Indian Geography, Heritage Publishers, New Delhi.
13. UNDP & World Resource Institute (2005) The Wealth of the Poor—Managing Ecosystems to Fight Poverty, World Resources Institute, Washington, DC 20002
14. Zimmermann, E W (1951) World Resources and Industries, Harper and Brothers, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Resource Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-502.1	3.0	1.0	1.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-502.2	3.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-502.3	3.0	2.0	2.0	2.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-502.4	3.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	1.8	1.8	2.0	2.3	1.0	3.0	3.0	3.0	2.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Resource Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-502.1	3.0	2.0	2.0	1.0
B-GEO-DSE-502.2	3.0	3.0	3.0	2.0
B-GEO-DSE-502.3	3.0	3.0	2.0	2.0
B-GEO-DSE-502.4	3.0	3.0	3.0	2.0
Average	3.0	2.8	2.5	1.8

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-503
Discipline Specific Elective Course Name: Settlement Geography

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-503.1:** Familiarization with basic concepts of settlement geography.
B-GEO-DSE-503.2: Enhancement of knowledge about types and patterns of rural settlements.
B-GEO-DSE-503.3: Provides critical view about different models of internal structure of cities.
B-GEO-DSE-503.4: Augmentation of knowledge on socio-spatial problems of cities.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Nature and scope of settlement geography.
2. Concepts of rural settlements: hamlet and village; urban settlements: town, city, metropolis, megalopolis.
3. Types and patterns of rural settlements and their determinants.

UNIT- II

4. Urban land use models: concentric zone model, sector model and multiple nuclei model.
5. Urban problems: housing, poverty, water supply and sanitation.
6. Expansion of urban spaces: rural-urban fringe and interaction.

Suggested Reading:

1. Chisholm M., 2007: Rural Settlement and Land Use, Transaction Publishers.
2. Daniel, P. 2002: Geography of Settlement, Rawat Publications, Jaipur & New Delhi.
3. Ghosh, Santwana 1999: A Geography of Settlements, Orient Longman, Kolkata.
4. Kalia Ravi, 1999: Chandigarh: The Making of Indian City, Oxford University Press.
5. Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: Urban Geography, John Wiley.
6. Krishan G., 1999: Inner Spaces – Outer Spaces of a Planned City: A Thematic Atlas of Chandigarh, Celebrating Chandigarh.
7. Misra, R. P. & Misra, K. eds. 1998: Million Cities of India, Sustainable Development Foundation, New Delhi.
8. Pacione M., 2009: Urban Geography: A Global Perspective, Taylor and Francis.
9. Ramachandran R., 1989: Urbanization and Urban Systems of India, Oxford University Press.
10. Ramachandran, R., 1992: The Study of Urbanization, Oxford University Press, Delhi
11. Singh R. Y., 1994: The Geography of Settlement, Rawat Publication, New Delhi.
12. Tiwari, R. C. 2000: Settlement Geography, (in Hindi), Prayag Publ., Allahabad.

Mapping of Course Outcomes to Program Outcomes (Settlement Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-503.1	3.0	2.0	2.0	1.0	2.0	1.0	2.0	3.0	3.0	2.0	2.0
B-GEO-DSE-503.2	3.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-503.3	3.0	2.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-503.4	3.0	3.0	3.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
Average	3.0	2.3	2.3	1.5	2.0	1.0	2.8	3.0	3.0	2.0	1.3

Mapping of Course Outcomes to Program Specific Outcomes (Settlement Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-503.1	3.0	2.0	2.0	2.0
B-GEO-DSE-503.2	3.0	2.0	2.0	2.0
B-GEO-DSE-503.3	3.0	3.0	3.0	2.0
B-GEO-DSE-503.4	3.0	3.0	3.0	2.0
Average	3.0	2.5	2.5	2.0

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-504
Discipline Specific Elective Course Name: Transport Geography

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-504.1: Provides understanding the basic concepts of transport geography.

B-GEO-DSE-504.2: Enhancement of knowledge about the factors and spatial pattern of transportation systems.

B-GEO-DSE-504.3: Capable to understand relationship between transport and location of economic activities.

B-GEO-DSE-504.4: Enrichment of knowledge about problems and management of urban transportation systems.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Nature, scope, significance and development of transport geography.
2. Factors associated with development of transport system; physical, economic, social cultural and institutional.
3. Regional variations in transport density; traffic flow and regional interaction; Bases of spatial interaction.

UNIT-III

4. Transport and locational activities; Impact of different aspects of transport on spatial equilibrium of location; problem of location and regional development.
5. Transportation network: Function, pattern and geometry; Models of network change.
6. Problems of urban transportation: transportation and environmental degradation; vehicular pollution and congestion; alternative to transport system in Mega-cities.

Suggested Readings:

1. Ashton, W.D., (1966): The Theory of Traffic Flow, Methuen, London
2. Bhaduri, S. 1992. Transport and Regional Development, Concept Publishing Company, New Delhi.
3. Berry, B.J.L et al. (1966): Essays on Commodity Flow and Spatial Structure of Indian Economy, Department of Geography, Chicago.
4. Berry, B.L.J. and Marble, D.F. (eds.) (1971): Spatial Analysis: A Reader in Statistical Geography, Prentice Hall.
5. Brooks, P.W., (1994): The Development of Air Transport Hurst, M.E. (ed.) Transportation geography: Comments and Reading, Mc Graw Hill, 256-273
6. Cooley, C.H. (1994): The Theory of Transportation, in Hurst, M.E. (ed.) Transportation geography: Comments and Reading, Mc Graw Hill, 15-29.
7. Fleming, D.K. and Hayuth, Y. (1994): Spatial Characteristics of Transportation Hubs: Centrality and Intermediacy, Journal of Transport Geography, 2 (1), 3-18.
8. Gautam, P.S. (1992) Transport Geography of India: A Study of Chambal Division, M.P., Mittal Publications, New Delhi
9. Huggett, P. (1965) Locational Analysis in Human Geography, Methuen, London.
10. Huggett, P. and Chorley, R.J. (1969) Networks in Geography, London.
11. Hay, A. 1973. Transport Economy, Macmillan, London.
12. Hoyle, B. S. and Knowles, R. 2000, Modern Transport Geography. John Wiley and Sons, New York.
13. Hoyle, B.S. 1973. Transport and Development. Macmillan, London.
14. Husain, M. and Zaidi, S.S.H. 1996. Environmental Management in India. Concept Publications, New Delhi.
15. Kensky, K.J., (1963): Structure of Transportation Networks: Relationships between Network Geometry and Regional Characteristics, University of Chicago, Department of Geography, Research Paper, Chicago, 84.

16. Nagar, V.D. and Gautam S. (1984): Principles and Problems of Indian Transport, Kailash PustakSadan, Gwalior.
17. Owen, W. (1968): Distance and Development: Transport and Communications in India, Washington.
18. Raza, M. and Aggarwal, Y., (1986) Transport Geography of India, Concept Publishing Company, New Delhi.
19. Taaffe, E.J. et al. (1963) Transport Expansion in Underdeveloped Countries: A Comparative Analysis, Geographical Review, 53:503-29.
20. Vaidya, B.C. 1998. Readings in Transport Geography, Devika Publications, New Delhi.
21. White, H. P. and Senior, M.L. (1983) Transportation Geography, Longman, London.

Mapping of Course Outcomes to Program Outcomes (Transport Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-504.1	3.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	1.0
B-GEO-DSE-504.2	3.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-504.3	3.0	2.0	3.0	2.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-504.4	3.0	2.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.0	2.0	1.5	2.3	1.3	2.8	2.8	2.8	2.0	1.5

Mapping of Course Outcomes to Program Specific Outcomes(Transport Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-504.1	3.0	2.0	2.0	1.0
B-GEO-DSE-504.2	3.0	2.0	3.0	2.0
B-GEO-DSE-504.3	3.0	3.0	3.0	2.0
B-GEO-DSE-504.4	3.0	2.0	3.0	2.0
Average	3.0	2.8	2.8	1.8

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-505
Discipline Specific Elective Course Name: Map Projections (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-505.1: Acquaintance with nature and significance of projections system.

B-GEO-DSE-505.2: Augmentation of skills to make cylindrical and conical projections.

B-GEO-DSE-505.3: Capability to construct zenithal and world map projections.

B-GEO-DSE-505.4: Enrichment of surveying skills using plane table.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise	= 24	File Record	= 08	Viva-voce	= 08
1.	Introduction to Map Projection: Meaning, Classification and importance; Characteristics of latitudes and longitudes lines.				
2.	Cylindrical projections: Characteristics, applications and drawing;			3 exercise	
	(i) Simple cylindrical projection				
	(ii) Cylindrical equal area projection.				
	(iii) True shape or orthomorphic or Mercator's Projection.				
3.	Conical Projections: Characteristics, applications and drawing.			5 exercise	
	(i) Simple conical projections with one standard parallel				
	(ii) Simple conical projection with two standards parallel				
	(iii) Bonne's Projection				
	(iv) Polyconic projection.				
	(v) International Map Projection.				
4.	Zenithal Projections: Characteristics, applications and drawing.			5 exercise	
	(i) Polar Zenithal Equidistant Projection.				
	(ii) Polar Zenithal Equal Area Projection				
	(iii) Polar Zenithal Gnomonic Projection				
	(iv) Polar Zenithal Stereographic Projection.				
	(v) Polar Zenithal Orthographic Projection				
5.	Characteristics, applications and drawings of:			2 exercise	
	(i) Sinusoidal and				
	(ii) Mollweide Projections				
6.	Plane Table Survey.			2 exercise	

Suggested Readings:

1. Khan, A.A. 1996. Text Book of Practical Geography, Concept, New Delhi.
2. Lawrence, GRP.1968. Cartographic Methods, Methuen, London.
3. Mishra R.P. and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
4. Monkhouse, F.J. and Wilkinson, H.R. 1994. Maps and Diagrams, Methuen, London.
5. Robinson, A.H. et.al. Elements of Cartography, John Wiley & Sons, 1995.
6. Singh, R.L., 1979. Elements of Practical Geography, Kalyani Publisher, New Delhi.
7. Sarkar, A.K 1997: Practical Geography-A Systematic Approach, Orient Longman, Calcutta.
8. Steers, J.B. Map Projections; University of London Press, London.

Mapping of Course Outcomes to Program Outcomes (Map Projections-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-505.1	3.0	1.0	3.0	2.0	1.0	3.0	3.0	3.0	1.0	1.0	1.0
B-GEO-DSE-505.2	3.0	2.0	3.0	2.0	1.0	3.0	3.0	3.0	1.0	1.0	1.0
B-GEO-DSE-505.3	3.0	1.0	3.0	2.0	2.0	3.0	3.0	3.0	1.0	2.0	1.0
B-GEO-DSE-505.4	3.0	2.0	3.0	3.0	1.0	2.0	3.0	3.0	1.0	2.0	1.0
Average	3.0	1.5	3.0	2.3	1.3	2.8	3.0	3.0	1.0	1.5	1.0

Mapping of Course Outcomes to Program Specific Outcomes(Map Projections-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-505.1	3.0	2.0	2.0	3.0
B-GEO-DSE-505.2	3.0	3.0	2.0	3.0
B-GEO-DSE-505.3	3.0	3.0	3.0	3.0
B-GEO-DSE-505.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.5	3.0

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-506
Discipline Specific Elective Course Name: Socio-economic Field Survey (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-506.1:** Makes students confident in handling field situations.
B-GEO-DSE-506.2: Gives opportunity to identify socio-economic problem.
B-GEO-DSE-506.3: Awareness about sampling techniques for data collection in the field.
B-GEO-DSE-506.4: Training of retrieval, analysis and interpretation of socio-economic field data.

Note for Paper Setters: Examiner will have to evaluate the candidate on the basis of field report prepared by the student.

Distribution of Marks for Evaluation of Project Report

Field Report: 24 marks

Viva-voce on report: 16 marks

Note: The students will carry out the socio-economic survey of a village or urban locality of at least 100 households/respondents and will prepare a field report.

Suggested Readings:

1. Black James A and D.J. champion (1976): Methods and Issues in social Research, New York, John Wiley and Sons, Inc.
2. Goode and Hat, Research Methodology in Social Sciences, Oxford University Press, New Delhi.
3. Har Prasad (1992): Research Methods and Techniques in Geography, Rawat Publishers, Jaipur.
4. Mishra, H.N. and Singh V.P. (ed.) (1998), Research Methodology: Social, Spatial and Policy Dimensions, Rawat Publishers, Jaipur.

Mapping of Course Outcomes to Program Outcomes (Socio-economic Field Survey-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-506.1	1.0	1.0	1.0	3.0	3.0	2.0	2.0	3.0	1.0	2.0	2.0
B-GEO-DSE-506.2	1.0	1.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	2.0	2.0
B-GEO-DSE-506.3	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-506.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0
Average	2.0	1.8	2.5	3.0	3.0	2.3	2.8	3.0	2.3	2.3	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Socio-economic Field Survey-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-506.1	2.0	2.0	3.0	3.0
B-GEO-DSE-506.2	2.0	3.0	3.0	3.0
B-GEO-DSE-506.3	3.0	3.0	3.0	3.0
B-GEO-DSE-506.4	3.0	3.0	3.0	3.0
Average	2.5	2.8	3.0	3.0

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-507
Discipline Specific Elective Course Name: MOOC Course from Swayam Portal

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-601
Discipline Specific Elective Course Name: Fundamental of Remote Sensing

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-601.1:** Acquaintance with fundamentals of remote sensing
B-GEO-DSE-601.2: Capability to interpret aerial photographs
B-GEO-DSE-601.3: Enrichment of skills to extract information from imageries.
B-GEO-DSE-601.4: Understanding the applications of remote sensing.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Introduction to aerial photographs: types and advantages.
2. Elements of aerial photo interpretation.
3. Digital photographs: sources and interpretation.

UNIT-II

4. Space borne remote sensing: electromagnetic spectrum, stages in remote sensing,
5. Type of satellites, nature of data and utility.
6. Applications of remote sensing: agriculture, environment and resource mapping.

Suggested Readings:

1. John R. Jensen 2009. Remote Sensing of the Environment-An Earth Resource Perspective, Pearson Education, (India Edition) New Delhi.
2. Kumar Meenakshi 2001. Remote Sensing, NCERT, New Delhi.
3. Lillesand and R.W. Kiefer, 2005. Remote Sensing and Image Interpretation, John Wiley and Sons.
4. Pritvish Nag, and M. Kudrat 1998. Digital Remote Sensing, Concept Publishing Company, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Remote Sensing)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-601.1	3.0	2.0	3.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	2.0
B-GEO-DSE-601.2	3.0	1.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-601.3	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
B-GEO-DSE-601.4	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0
Average	3.0	2.3	3.0	2.0	2.8	3.0	2.8	2.5	2.8	2.3	2.5

Mapping of Course Outcomes to Program Specific Outcomes(Remote Sensing)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-601.1	3.0	2.0	3.0	3.0
B-GEO-DSE-601.2	3.0	3.0	2.0	3.0
B-GEO-DSE-601.3	3.0	3.0	3.0	3.0
B-GEO-DSE-601.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.8	3.0

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-602
Discipline Specific Elective Course Name: Introduction to Geospatial Technology

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-602.1: Acquaintance with the fundamentals of geo-spatial technology.

B-GEO-DSE-602.2: Capability to understand geographical information systems hardware, software and data types.

B-GEO-DSE-602.3: Knowledge about types and functioning of global positioning system.

B-GEO-DSE-602.4: Understanding about the applications of geospatial technology.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Introduction to geo-spatial technology: remote sensing, geographical information systems and global positioning system
2. Elements of geographical information system: hardware, software and data requirements.
3. Structure of spatial and non-spatial data and data base management system.

UNIT-II

4. Application of geographical information system in urban, regional and real time planning.
5. Global positioning system: types and functioning.
6. Applications of global positioning system and mobile mapping.

Suggested Readings:

1. Burrough, P.A. and McDonnell, R. (1998). Principles of Geographic Information Systems. Oxford University Press, Oxford.
2. Bhatta Basudeb (2014). Remote Sensing and GIS. Oxford University Press, Oxford.
3. Guha Pardeep (2013). Remote Sensing for the Beginner. East West Press, New Delhi.
4. Heywood I, Cornelius S and Carver S. 2000. An Introduction to Geographical Information Systems, Longman, New York.
5. Meenakshi Kumar (2000). Text Book on Remote Sensing. NCERT, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Geo-spatial Technology)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-602.1	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0
B-GEO-DSE-602.2	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
B-GEO-DSE-602.3	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-602.4	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.5	3.0	2.0	3.0	3.0	3.0	3.0	2.8	2.0	2.3

Mapping of Course Outcomes to Program Specific Outcomes(Geo-spatial Technology)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-602.1	3.0	2.0	3.0	2.0
B-GEO-DSE-602.2	3.0	3.0	3.0	3.0
B-GEO-DSE-602.3	3.0	3.0	3.0	3.0
B-GEO-DSE-602.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	3.0	2.8

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-603
Discipline Specific Elective Course Name: Geography of Asia

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-603.1:** Awareness about physiographic structure of Asia.
B-GEO-DSE-603.2: Knowledge about the characteristics of people.
B-GEO-DSE-603.3: Understanding about distribution pattern of major crops and cropping pattern.
B-GEO-DSE-603.4: Acquaintance with the distribution pattern of major minerals and industries.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Physiographic characteristics, climate, natural vegetation and major river systems
2. Demographic attributes: population distribution, density, growth and urbanization.
3. Socio-cultural attributes: languages, religions and races.

UNIT-II

4. Agriculture: area, production and yield of wheat, rice, sugarcane, cotton, tea, coffee and rubber.
5. Minerals distribution and production: iron-ore, manganese, mica, coal and petroleum.
6. Major industries and trade: textile, iron and steel, petro-chemicals, automobiles and electronics.

Suggested Readings:

1. Farmer, B. H. (1993): An Introduction to South Asia, Routledge Publications, London.
2. Hussain, M. (2012) World Geography, Rawat, Jaipur.
3. Memoria, C. and Aggarwal, M.L. (2018) Geography of Asia, Sahitya Bhawan, New Delhi.
4. Sharma, Y.K. (2019) Geography of Asia, Lakshmi Narain Aggarwal Publisher, New Delhi.
5. Stamp L.D. (1952) Asia: A Regional and Economic Geography, Methuen, London.
6. Tirtha, R. (2006) Geography of Asia, Rawat publication, Jaipur.

Mapping of Course Outcomes to Program Outcomes (Geography of Asia)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-603.1	3.0	1.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	1.0	2.0
B-GEO-DSE-603.2	3.0	2.0	2.0	2.0	3.0	1.0	2.0	3.0	3.0	2.0	2.0
B-GEO-DSE-603.3	3.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	3.0	2.0	2.0
B-GEO-DSE-603.4	3.0	2.0	2.0	1.0	1.0	1.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.0	2.0	1.5	2.0	1.0	2.5	3.0	3.0	1.8	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Geography of Asia)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-603.1	3.0	2.0	2.0	2.0
B-GEO-DSE-603.2	3.0	2.0	2.0	2.0
B-GEO-DSE-603.3	3.0	2.0	2.0	2.0
B-GEO-DSE-603.4	3.0	2.0	2.0	2.0
Average	3.0	2.0	2.0	2.0

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-604
Discipline Specific Elective Course Name: Geography of Europe

Time: 2 $\frac{1}{2}$ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-604.1:** Awareness about physiographic structure of Europe.
B-GEO-DSE-604.2: Knowledge about the demographic characteristics of people.
B-GEO-DSE-604.3: Acquaintance with distribution pattern of agriculture, forestry and fisheries.
B-GEO-DSE-604.4: Understanding the distribution pattern of minerals, industries and international trade.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Physical features: relief, physiographic regions, climate, drainage, soils and natural vegetation.
2. Demographic characteristics: population distribution, density and growth.
3. Socio-cultural attributes: languages, ethnic groups and migrant groups.

UNIT-II

4. Agriculture, forestry and fisheries.
5. Distribution of major minerals and industries.
6. International trade, transport and communication, European Union.

Suggested Readings:

1. Brian W. Blouet(2007), The EU and Neighbors: A Geography of Europe in the Modern, Wiley Publishers.
2. Eduard A. Koster (2005), A Physical Geography of Western Europe (Oxford Regional Environments), Oxford University Press.
3. Goran Mutabdzija (2018), Regional Geography of Europe, Independently Published.
4. Jean Gottmann (1969), Geography of Europe, Holt McDougal, California.
5. Thomas Alford Smith (2012), A Geography of Europe, Rare Books Club.

Mapping of Course Outcomes to Program Outcomes (Geography of Europe)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-604.1	3.0	1.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-604.2	3.0	1.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-604.3	3.0	2.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-604.4	3.0	2.0	2.0	1.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	1.5	2.0	1.0	2.0	1.3	3.0	3.0	3.0	2.0	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Geography of Europe)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-604.1	3.0	2.0	2.0	2.0
B-GEO-DSE-604.2	3.0	2.0	2.0	2.0
B-GEO-DSE-604.3	3.0	3.0	2.0	2.0
B-GEO-DSE-604.4	3.0	2.0	3.0	2.0
Average	3.0	2.3	2.3	2.0

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-605
Discipline Specific Elective Course Name: Elementary Remote Sensing (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-605.1:** Familiarization with the skill of measurements on aerial photographs.
B-GEO-DSE-605.2: Development of art of visualizing 3-D surface on photographs.
B-GEO-DSE-605.3: Capability to read and interpret physical and cultural features on photographs.
B-GEO-DSE-605.4: Ability to extract features from satellite imageries.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks

Exercise	= 24	File Record	= 08	Viva-voce	= 08
1. Demarcation of principal point				1 exercise	
2. Conjugate principal point				1 exercise	
3. Flight line				1 exercise	
4. Determination of scale of photograph				1 exercise.	
5. Making of 3-D using stereoscope				1 exercise.	
6. Reading of ZESIS card				1 exercise	
7. Interpretation of physical features from aerial photograph				1 exercise.	
8. Interpretation of cultural features from aerial photograph				1 exercise	
9. Demarcation of land use from aerial photograph				1 exercise	
10. Identification of satellite imagery of an area using row and path				1 exercise	
11. Construction of spectral reflectance curves of ground features				1 exercise	
12. Interpretation of a satellite imagery				1 exercise	

Suggested Readings:

1. Bhatta Basudeb (2014). Remote Sensing and GIS. Oxford University Press, Oxford.
2. Guha Pardeep (2013). Remote Sensing for the Beginner. East West Press, New Delhi.
3. Kumar Meenakshi 2001. Remote Sensing, NCERT, New Delhi.
4. Lillesand and R.W. Kiefer, 2005. Remote Sensing and Image Interpretation, John Wiley and Sons.
5. Pritvish Nag, and M. Kudrat 1998. Digital Remote Sensing, Concept Publishing Company, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Elementary Remote Sensing-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-605.1	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	1.0	2.0
B-GEO-DSE-605.2	3.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0	2.0	2.0	2.0
B-GEO-DSE-605.3	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-605.4	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.3	3.0	2.3	3.0	3.0	2.8	3.0	2.8	1.8	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Elementary Remote Sensing-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-605.1	3.0	3.0	3.0	2.0
B-GEO-DSE-605.2	3.0	2.0	3.0	3.0
B-GEO-DSE-605.3	3.0	3.0	3.0	3.0
B-GEO-DSE-605.4	3.0	3.0	3.0	2.0
Average	3.0	2.8	3.0	2.5

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-606
Discipline Specific Elective Course Name: Physical Field Survey (Practical)

Time: 3 Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 40
Internal Assessment Marks : 10

Course outcomes (COs):

- B-GEO-DSE-606.1:** Makes students confident in handling field situations.
B-GEO-DSE-606.2: Gives opportunity to identify geo-physical problems.
B-GEO-DSE-606.3: Awareness about techniques for data collection in the field.
B-GEO-DSE-606.4: Training of analysis and interpretation of physical field data.

Note for Paper Setters: Examiner will have to evaluate the candidate on the basis of field report prepared by the student.

Distribution of Marks for Evaluation of Project Report

Field Report: 24 marks

Viva-voce on report: 16 marks

Note: The students will carry out the survey of physical environment of a site such as landforms, climate, soils, drainage and natural vegetation under the supervision of a teacher and will prepare a field report.

Suggested Readings:

1. Ahmed L, Kanth RA, Parvez S and Mahdi S. 2017. Experimental Agrometeorology-A Practical Manual. Springer Publication.
2. Bunnet RB. 1965. Physical Geography in Diagrams. Pearson Education, NOIDA, India.
3. Ghosh RK. 1999. Practical Hydrology. Roman Printers Pvt. Ltd. Howrah, West Bengal.
4. Gomez B and John Paul Jones. 2010. Research Methods in Geography-A Critical Introduction. Wiley Blackwell Publications, Singapore.
5. Goudie A. 1990. Geomorphological Techniques. Unwin Hyman, London.
6. Walsh MK. 2014. Teaching Geographic Field Methods using Paleocology. Journal of Geography 113: 97-106.

Mapping of Course Outcomes to Program Outcomes (Physical Field Survey-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-606.1	1.0	3.0	3.0	3.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-606.2	2.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-606.3	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-606.4	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Average	2.3	2.5	3.0	3.0	3.0	1.8	3.0	3.0	3.0	2.3	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Physical Field Survey-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-606.1	1.0	3.0	2.0	3.0
B-GEO-DSE-606.2	2.0	3.0	3.0	3.0
B-GEO-DSE-606.3	3.0	3.0	3.0	3.0
B-GEO-DSE-606.4	3.0	3.0	2.0	3.0
Average	2.3	3.0	2.5	3.0

Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes (BA Humanities Geography)

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
B-GEO-101	3.0	2.5	1.8	1.5	2.5	1.3	2.5	3.0	2.8	1.3	2.3	3.0	2.5	3.0	2.5
B-GEO-102	3.0	3.0	2.5	1.8	3.0	1.8	2.5	3.0	2.8	1.5	2.5	3.0	3.0	2.5	2.5
B-GEO-103	3.0	2.0	1.5	1.5	2.3	2.8	2.0	3.0	1.0	1.3	2.3	3.0	1.8	2.8	2.0
B-GEO-201	3.0	2.8	2.8	2.3	3.0	2.3	2.8	3.0	3.0	1.8	2.5	3.0	2.8	2.5	2.5
B-GEO-202	3.0	2.8	1.8	1.5	2.8	1.0	1.5	3.0	2.0	1.8	1.8	3.0	2.0	2.8	2.5
B-GEO-203	3.0	2.5	2.5	2.5	2.8	2.3	2.3	3.0	1.8	2.0	3.0	3.0	2.8	3.0	3.0
B-GEO-301	3.0	3.0	2.0	2.0	1.5	1.0	2.0	3.0	2.0	1.0	2.0	3.0	1.0	1.0	3.0
B-GEO-302	3.0	2.8	2.3	2.8	1.8	1.5	2.3	3.0	2.0	2.0	2.3	3.0	3.0	3.0	3.0
B-GEO-303	3.0	2.8	2.0	2.3	1.8	2.0	1.8	2.5	1.8	1.8	1.8	2.8	2.5	2.5	2.8
B-GEO-401	3.0	2.5	2.0	1.8	1.5	1.3	1.8	3.0	2.0	2.0	2.0	2.8	2.0	2.8	2.5
B-GEO-402	3.0	2.0	2.0	1.5	1.8	2.0	1.5	2.8	2.5	1.0	1.0	3.0	2.3	2.3	2.3
B-GEO-403	3.0	2.5	2.5	2.0	2.0	2.0	2.0	2.5	2.0	1.3	2.0	3.0	1.8	1.8	1.8
B-GEO-SEC-404	3.0	3.0	2.8	2.0	2.0	2.0	1.8	2.8	2.0	1.3	1.8	3.0	2.3	2.3	2.3
B-GEO-SEC-405	3.0	2.8	2.5	2.3	2.3	2.5	2.3	2.8	2.0	1.0	2.0	3.0	2.5	2.8	2.5
B-GEO-DSE-501	3.0	1.8	2.0	2.3	2.8	2.3	3.0	3.0	2.5	1.8	2.0	3.0	2.5	2.5	2.5
B-GEO-DSE-502	3.0	1.8	1.8	2.0	2.3	1.0	3.0	3.0	3.0	2.0	2.0	3.0	2.8	2.5	1.8
B-GEO-DSE-503	3.0	2.3	2.3	1.5	2.0	1.0	2.8	3.0	3.0	2.0	1.3	3.0	2.5	2.5	2.0
B-GEO-DSE-504	3.0	2.0	2.0	1.5	2.3	1.3	2.8	2.8	2.8	2.0	1.5	3.0	2.8	2.8	1.8
B-GEO-DSE-505	3.0	1.5	3.0	2.3	1.3	2.8	3.0	3.0	1.0	1.5	1.0	3.0	2.8	2.5	3.0
B-GEO-DSE-506	2.0	1.8	2.5	3.0	3.0	2.3	2.8	3.0	2.3	2.3	2.0	2.5	2.8	3.0	3.0
B-GEO-DSE-507*															
B-GEO-DSE-601	3.0	2.3	3.0	2.0	2.8	3.0	2.8	2.5	2.8	2.3	2.5	3.0	2.8	2.8	3.0
B-GEO-DSE-602	3.0	2.5	3.0	2.0	3.0	3.0	3.0	3.0	2.8	2.0	2.3	3.0	2.8	3.0	2.8
B-GEO-DSE-603	3.0	2.0	2.0	1.5	2.0	1.0	2.5	3.0	3.0	1.8	2.0	3.0	2.0	2.0	2.0
B-GEO-DSE-604	3.0	1.5	2.0	1.0	2.0	1.3	3.0	3.0	3.0	2.0	1.8	3.0	2.3	2.3	2.0
B-GEO-DSE-605	3.0	2.3	3.0	2.3	3.0	3.0	2.8	3.0	2.8	1.8	2.0	3.0	2.3	3.0	2.3
B-GEO-DSE-606	2.3	2.5	3.0	3.0	3.0	1.8	3.0	3.0	3.0	2.3	2.0	2.3	3.0	2.5	3.0

* MOOC Course from Swayam Portal.

Attainment of COs:

The attainment of COs can be measured on the basis of the results of Internal Assessment Marks and semester examination. The attainment is measured on scale of 3 after setting the target for COs attainment.

Following table shows the CO attainment levels assuming the set target of 60% marks:

CO Attainment Levels for internal assessment

Attainment Level	
1 (low level of attainment)	60% of students score more than 60% of marks in class tests of a course.
2 (Medium level of attainment)	70% of students score more than 60% of marks in class tests of a course.
3 (High level of attainment)	80% of students score more than 60% of marks in class tests of a course.

Note: In the above table, the set target is assumed as 60%. It may vary in different departments/institutes. The staff councils of the departments/institutes may finalize the set target.

A proper mapping of course outcomes with assessment methods should be defined before measuring the attainment level. The questions in tests for internal assessment are based on COs. Here it is assumed that class test-I is based on first two COs (i.e. **B-GEO-101.1** and **B-GEO-101.2**) of a course with equal weightage given to both COs. Similarly, class test-II is based on next two COs (i.e. **B-GEO-101.3** and **B-GEO-101.4**) of a course with equal weightage given to these two COs. For each internal assessment test, the percentage of students attaining the target level of CO is estimated and average percentage will decide the attainment level of COs. Following steps may be followed for determining the attainment level in internal assessment of a course.

- Estimate the %age of students scoring set target (say 60%) or more in the question(s) of test -I based on first CO i.e. **B-GEO-101.1**.

- (ii) Estimate the %age of students scoring set target (60%) or more in the question(s) of test-I based on second CO i.e. **B-GEO-101.2.**
- (iii) Estimate the %age of students scoring set target (60%) or more in the question(s) of test-II based on third CO i.e. **B-GEO-101.3.**
- (iv) Estimate the %age of students scoring set target (60%) or more in the question(s) of test-II based on the fourth CO i.e. **B-GEO-101.4.**
- (v) Take average of the percentages obtained above.
- (vi) Determine the attainment level i.e. 3,2 or 1 as per scale defined in **the above table.**

Note: In the above steps, it is assumed that internal assessment is based on two tests only. However, if internal assessment is based on more than two tests and/or on assignments then same may be incorporated to determine the COs attainment level. There may be more than four COs for a course. The set target may also be different for different COs. These issues may be resolved by the staff councils of the departments/institutes.

For determining the attainment levels for end semester examination, it is assumed that questions in the end term examination are based on all COs of the course. Attainment levels for end semester examination of a course can be determined after the declaration of the results. The CO attainment levels for end semester examination are given in **the following Table.**

CO Attainment Levels for End Semester Examination (ESE)

Attainment Level	
1 (Low level of attainment)	60% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
2 (Medium level of attainment)	70% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
3 (High level of attainment)	80% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.

Note: In the above table, the set target is assumed as grade A for CBCS courses and 60% for non-CBCS courses. It may vary in different departments/institutes. The staff councils of the departments/institutes may finalize the set target.

Overall CO Attainment level of a Course:

The overall CO attainment level of a course can be obtained as:

$$\text{Overall CO attainment level} = 50\% \text{ of CO attainment level in internal assessment} + 50\% \text{ of CO attainment level in end semester examination.}$$

The overall COs attainment level can be obtained for all the courses of the program in a similar manner.

Attainment of POs:

The overall attainment level of POs is based on the values obtained using direct and indirect methods in the ratio of 80:20. The direct attainment of POs is obtained through the attainment of COs. The overall CO attainment value as estimated above and CO-PO mapping value as shown in **Table 3** are used to compute the attainment of POs. PO attainment values obtained using direct method can be written as shown in **the following Table.**

PO Attainment Values using Direct Method

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-101											
B-GEO-102											
B-GEO-103											
B-GEO-201											
B-GEO-202											
B-GEO-203											
B-GEO-301											
B-GEO-302											
B-GEO-303											
B-GEO-401											
B-GEO-402											
B-GEO-403											
B-GEO-SEC-404											
B-GEO-SEC-405											
B-GEO-DSE-501											
B-GEO-DSE-502											
B-GEO-DSE-503											
B-GEO-DSE-504											
B-GEO-DSE-505											
B-GEO-DSE-506											
B-GEO-DSE-507*											
B-GEO-DSE-601											
B-GEO-DSE-602											
B-GEO-DSE-603											
B-GEO-DSE-604											
B-GEO-DSE-605											
B-GEO-DSE-606											
Direct PO attainment	Average of above values	Average of above values	Average of above values	--	--	--	--	--	--	--	Average of above values

* Code will be decided as per the choice of student from the group of generic electives.

The PO attainment values to be filled in above table can be obtained as follows:

For B-GEO-101-PO1 Cell:

PO1 attainment value = (Mapping factor of **B-GEO-101-PO1** from **Table 3** × Overall CO attainment value for the course **B-GEO-101**)/3

For B-GEO-201-PO1 Cell:

PO1 attainment value = (Mapping factor of **B-GEO-201-PO1** from **Table 3** × Overall CO attainment value for the course **B-GEO-201**)/3

Similarly, values for each cell of the above table can be obtained. The direct attainment of POs is average of individual PO attainment values.

In order to obtain the PO attainment using indirect method, a student exit survey based on the questionnaire of POs may be conducted at end of last semester of the program. The format for the same is given in the following table. Average of the responses from the outgoing students for each PO is estimated.

The overall PO attainment values are obtained by adding attainment values estimated using direct and indirect methods in the proportion of 80:20 as follows:

Overall attainment value for PO1 = $0.8 \times$ average attainment value for PO1 using direct method (from above table) + $0.2 \times$ average response of outgoing students for PO1. Similarly, overall attainment value can be obtained for each PO.

Questionnaire for indirect measurement of PO attainment(For outgoing students)

At the end of my degree program I am able to do:

	Please tick any one		
Statement of PO1	3	2	1
Statement of PO2	3	2	1
Statement of PO3	3	2	1
Statement of PO4	3	2	1
Statement of PO5	3	2	1
Statement of PO6	3	2	1
Statement of PO7	3	2	1
Statement of PO8	3	2	1
Statement of PO9	3	2	1
Statement of PO10	3	2	1
Statement of PO11	3	2	1
3: Strongly Agree; 2: Agree; 1: Average			

Overall PO attainment values can be written as shown **in the following Table.**

Overall PO attainment Values

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Direct PO attainment											
Indirect PO attainment											
Overall PO attainment											
Target	2	2	2	2	2	1.5	2	2	2	2	1.5

The overall PO attainment values obtained above are compared with set target. The set target for each PO may be different and can be finalized by the staff councils of the departments/institutes. If overall PO attainment value is less than the set target value then an action plan may be prepared for improvement in the subsequent academic session.

The overall PSO attainment level based on CO-PSO mapping values and overall CO attainment values can be obtained in a similar manner.

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)



DEPARTMENT OF GEOGRAPHY

CBCS CURRICULUM (2020-21)
Program Name: M.Sc. (Geography)
(For the Batches Admitted From 2020-2021)

OUTCOME BASED EDUCATION SYSTEM

CBCS CURRICULUM (2020-21)
Program Name: M.Sc. (Geography)
(For the Batches Admitted From 2020-2021)

VISION

Be globally acknowledged as a distinguished centre of academic excellence.

MISSION

To prepare a class of proficient scholars and professionals with ingrained human values and commitment to expand the frontiers of knowledge for the advancement of society.

DEPARTMENT VISION AND MISSION

VISION

- To become a model department as a Centre of quality education, research with innovation and recognition at National and International level for serving the society.

MISSION

- **M1:** To provide quality education to aspiring young minds for improving their skills, inculcating values, creating leadership qualities and enhance research with innovative methods.
- **M2:** To produce young geographers who would contribute in the areas of higher education, regional and national planning, development, environment, ethics and sustainable environment development.
- **M3:** To develop Teaching-Learning methods which can produce socially committed professionals who contribute effectively in nation building.

Mapping of University Vision and Mission to Department Vision and Mission

Acclaimed as modal Centre of Learning and Research by

University Vision and Mission	Department Vision and Mission
High quality knowledge delivery through state of art infrastructure and ethical values to the students	Yes
Students excellence will make them professionals and innovators emerging as national and global leaders	Yes
Research and development will help in furtherance of faculty knowledge	Yes

Program Outcomes (PO) with Post Graduate Attributes

Programme outcomes are attributes of the post graduates from the programme that are indicative of the post graduates' ability and competence to work after being a qualified professional geographer upon post-graduation. Program outcomes are statements that describe what students are expected to know or do by the time of post-graduation, they must relate to knowledge and skills that the students acquire from the programme. The achievement of all outcomes indicates that the student is well prepared to achieve the program educational objectives down the road. The department of geography has the following eleven PO's. The course syllabi and the overall curriculum have been designed to achieve these outcomes:

Program Outcomes (PO) for Post Graduate Programmes (CBCS) in the Faculty of Sciences, Kurukshetra University, Kurukshetra

PO1	Knowledge	Capable of demonstrating comprehensive disciplinary knowledge gained during course of study
PO2	Research Aptitude	Capability to ask relevant/appropriate questions for identifying, formulating and analyzing the research problems and to draw conclusion from the analysis
PO3	Communication	Ability to communicate effectively on general and scientific topics with the scientific community and with society at large
PO4	Problem Solving	Capability of applying knowledge to solve scientific and other problems
PO5	Individual and Team Work	Capable to learn and work effectively as an individual, and as a member or leader in diverse teams, in multidisciplinary settings.
PO6	Investigation of Problems	Ability of critical thinking, analytical reasoning and research-based knowledge including design of experiments, analysis and interpretation of data to provide conclusions
PO7	Modern Tool usage	Ability to use and learn techniques, skills and modern tools for scientific practices
PO8	Science and Society	Ability to apply reasoning to assess the different issues related to society and the consequent responsibilities relevant to the professional scientific practices
PO9	Life-Long Learning	Aptitude to apply knowledge and skills that are necessary for participating in learning activities throughout life
PO10	Ethics	Capability to identify and apply ethical issues related to one's work, avoid unethical behaviour such as fabrication of data, committing plagiarism and unbiased truthful actions in all aspects of work
PO11	Project Management	Ability to demonstrate knowledge and understanding of the scientific principles and apply these to manage projects

Program Specific Outcomes (PSO's):

- **PSO1:** Understanding the human and physical environmental phenomena using specialized knowledge pertaining to various sub-fields of geography.
- **PSO2:** Ability to use the state of art geospatial knowledge for resolving the social, economic, cultural and physical problems of the society.
- **PSO3:** Learning the techniques of data acquisition, data processing and interpretation of locational and spatial data.
- **PSO4:** Ability to demonstrate and communicate the geographical knowledge and inculcate analytical ability, research aptitude and relevant skills.

Kurukshetra University Kurukshetra
Scheme of Examination and Syllabus for M. Sc.
under Choice Based Credit System w.e.f. 2020-21 in phased manner
Subject: Geography

Course Code and Type	Nomenclature of the Paper	Credits	Hours/Week	External Assessment Marks	Internal Assessment Marks	Total Marks	Duration of Exam.
Semester-I							
M-GEO-101 (core)	Climatology	4	4	70	30	100	3 Hours
M-GEO-102 (core)	Geography of India	4	4	70	30	100	3 Hours
M-GEO-103 (core)	Economic Geography	4	4	70	30	100	3 Hours
M-GEO-104 (core)	Statistical Methods in Geography	4	4	70	30	100	3 Hours
M-GEO-105 (core)	Cartographic Methods in Geography (Theory)	2	2	35	15	50	2½ Hours
M-GEO-106 (core)	Cartographic Methods in Geography (Practical)	4	8	70	30	100	3 Hours
Semester-II							
M-GEO-201 (core)	Geomorphology	4	4	70	30	100	3 Hours
M-GEO-202 (core)	Population Geography	4	4	70	30	100	3 Hours
M-GEO-203 (core)	Regional Development and Planning with Special Reference to India	4	4	70	30	100	3 Hours
M-GEO-204 (core)	Agricultural Geography with Special Reference to India	4	4	70	30	100	3 Hours
M-GEO-205 (core)	Morphometric Analysis (Theory)	2	2	35	15	50	2½ Hours
M-GEO-206 (core)	Morphometric Analysis (Practical)	4	8	70	30	100	3 Hours
M-GEO-OE-204	General Geography of India	2	2	35	15	50	2½ Hours
Semester III							
M-GEO-301 (core)	Geography and Ecosystems	4	4	70	30	100	3 Hours
M-GEO-302 (core)	Field Methods in Geography (Socio-economic) (Theory)	2	2	35	15	50	2½ Hours
M-GEO-303(i) (elective)	Urban Geography	4	4	70	30	100	3 Hours
M-GEO-303(ii) (elective)	Geography of Wellbeing with Special Reference to India	4	4	70	30	100	3 Hours
M-GEO-303(iii) (elective)	Fluvial Geomorphology	4	4	70	30	100	3 Hours
M-GEO-303(iv) (elective)	Climate Change and Earth Systems	4	4	70	30	100	3 Hours
M-GEO-303 (v) (elective)	Resource Geography	4	4	70	30	100	3 Hours
M-GEO-304 (i) (elective)	Political Geography	4	4	70	30	100	3 Hours
M-GEO-304 (ii) (elective)	Geography of Rural Settlements	4	4	70	30	100	3 Hours
M-GEO-304 (iii) (elective)	Soil Geography	4	4	70	30	100	3 Hours
M-GEO-304 (iv) (elective)	Geography and Disaster Management	4	4	70	30	100	3 Hours
M-GEO-304 (v) (elective)	Biogeography	4	4	70	30	100	3 Hours
M-GEO-305 (core)	Introduction to Remote Sensing (Theory)	2	2	35	15	50	2½ Hours
M-GEO-306 (core)	Introduction to Remote Sensing (Practical)	4	8	70	30	100	3 Hours
M-GEO-307 (core)	Project Report Based on Field Survey	4	4	70	30	100	3 Hours
M-GEO-OE-304	General Geography of World	2	2	35	15	50	2½ Hours
Semester IV							
M-GEO-401 (core)	Geographical Thought	4	4	70	30	100	3 Hours
M-GEO-402 (core)	Hydrology and Oceanography	4	4	70	30	100	3 Hours
M-GEO-403(i) (elective)	Regional Geography of India with Special Reference to Haryana	4	4	70	30	100	3 Hours
M-GEO-403 (ii) (elective)	Health Geography with Special Reference to India	4	4	70	30	100	3 Hours
M-GEO-403 (iii) (elective)	Social Geography with Special Reference to India	4	4	70	30	100	3 Hours
M-GEO-403(iv) (elective)	Coastal Geomorphology	4	4	70	30	100	3 Hours
M-GEO-403 (v) (elective)	Tropical Climatology	4	4	70	30	100	3 Hours
M-GEO-404 (i) (elective)	Gender Geography	4	4	70	30	100	3 Hours
M-GEO-404 (ii) (elective)	Geography of Tourism with Special Reference to India	4	4	70	30	100	3 Hours
M-GEO-404 (iii) (elective)	Cultural Geography	4	4	70	30	100	3 Hours
M-GEO-404 (iv) (elective)	Geography of Water Resources	4	4	70	30	100	3 Hours
M-GEO-404 (v) (elective)	Urbanization in India	4	4	70	30	100	3 Hours
M-GEO-405 (core)	Fundamentals of Geographical Information Systems (Theory)	2	2	35	15	50	2½ Hours
M-GEO-406 (core)	Fundamentals of Geographical Information Systems (Practical)	4	8	70	30	100	3 Hours

Semester-I
Core Course Code: M-GEO-101
Core Course Name: Climatology

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

- M-GEO-101.1:** Enhancement of knowledge about atmospheric constituents and structure.
M-GEO-101.2: Development of scientific understanding about climatic elements and their characteristics.
M-GEO-101.3: Sharpens the understanding about atmospheric moisture, stability, instability and weather systems.
M-GEO-101.4: Enrichment of knowledge about climatic classification, climate change and global warming.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Definition of weather and climate; Climatology and Meteorology.
2. Origin, composition and structure of atmosphere.
3. Solar radiation, greenhouse effect, heat budget and temperature distribution.

UNIT-II

4. Atmospheric pressure and its distribution pattern.
5. Theories of general circulation and planetary winds.
6. Walker circulation- ENSO and La Nina, origin of monsoons and jet streams.

UNIT-III

7. Atmospheric Moisture: humidity, evaporation, condensation; precipitation formation theories and types of precipitation, acid rain.
8. Stability and instability of atmosphere, air masses and fronts.
9. Weather systems: Origin and characteristics of extra tropical and tropical cyclones.

UNIT-IV

10. Climatic classification: Bases of climatic classification by Koeppen, Trewartha and Thornthwaite.
11. Climatic change: pattern, evidences and theories of climate change.
12. Global warming and its impacts on earth systems.

Suggested Readings:

1. Athrens, C. D. Meteorology Today: An Introduction to Weather, Climate and Environment, West Publishing Co., 1994
2. Barry, R. G. and Chorley, R. J. Atmosphere, Weather and Climate, Marth Ren, 2010.
3. Critchfield, H. J. General Climatology, Prentice Hall of India, New Delhi, 1987.
4. Collins, J.M. Climatology, Oxford, 2014.
5. Das, P.K. The Monsoons, National Book Trust, New Delhi, 1984.
6. Lal, D.S. Climatology, Chaitanya Publishing House, Allahabad, 1966.
7. Lutgens, F.K. and Tarbuck, E.J. The Atmosphere: An Introduction to Meteorology, Prentice Hall of India, New Delhi, 2010.
8. Miller, A.A. Climatology, Methuen and Co., London, 1979.
9. Oliver, J.E. and Hidore, J.J. Climatology: An Atmospheric Science, Pearson Education Inc. New Delhi, 2003.
10. Ram Sastry, AA, Weather and Weather Forecasting, Publication Division, New Delhi.
11. Trewartha G. T., An Introduction to Climate, McGraw Hill Company, New York, 1980.

Mapping of Course Outcomes to Program Outcomes (Climatology)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-101.1	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0
M-GEO-101.2	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0
M-GEO-101.3	3.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0
M-GEO-101.4	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	1.0
Average	3.0	3.0	2.3	2.5	2.0	2.8	2.8	3.0	3.0	2.3	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Climatology)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-101.1	3.0	3.0	2.0	3.0
M-GEO-101.2	3.0	3.0	3.0	3.0
M-GEO-101.3	3.0	3.0	3.0	3.0
M-GEO-101.4	3.0	2.0	3.0	3.0
Average	3.0	2.8	2.8	3.0

Semester-I
Core Course Code: M-GEO-102
Core Course Name: Geography of India

Time: 3 Hours

Credits: 4

Total Marks : 100

External Assessment Marks : 70

Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-102.1: Provides understanding about the physical structure of India.

M-GEO-102.2: Enrichment of understanding about spatial organization of agriculture and irrigation systems.

M-GEO-102.3: Acquaintance with geographical distribution and production of major resources.

M-GEO-102.4: Enhancement of knowledge about spatial distribution of industries and international trade of India.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Physiography: relief characteristics and physiographical divisions
2. Drainage systems and their functional significance.
3. Climate: characteristics, seasons and climatic regions of India.
4. Soil and vegetation types: their distribution, characteristics and conservation.

UNIT-II

5. Agriculture: major characteristics, agricultural development.
6. Problems of Indian agriculture.
7. Irrigation: types, major projects with reference to Bhakra Nangal, Narmada and Damodar Valley Projects.

UNIT-III

8. Production, distribution, status of use and conservation of metallic minerals: iron ore and bauxite.
9. Production, distribution, status of use and conservation of non-metallic minerals: mica and manganese.
10. Production, distribution, status of use and conservation of following power resources: coal, petroleum and hydropower

UNIT-IV

11. Production and distribution of (a) iron and steel (b) cotton textile (c) sugar and (d) automobile industry.
12. Major industrial regions and their characteristics.
13. International trade: major exports and imports.

Suggested Readings:

1. Dubey, R. N., 1974: Economic Geography of India, Kitab Mahal, Allahabad
2. Hussain Majid (2015): Geography of India, Mc Graw Hill Education.
3. Joshi, H. L., 1990: Industrial Geography of India, Rawat Publications, Jaipur
4. Nag, P. and Sengupta, S., 1992: Geography of India, Concept publications. Co., New Delhi.
5. Singh, R. L.: India: A Regional Geography, N.G.S.I., Varanasi, 1971
6. Sharma, T. C. and Coutinho, O. 1988: Economic and Commercial Geography of India. Vikas Publishing House Pvt. Ltd, New Delhi.
7. Singh, S. and Saroha, J. 2019. Geography of India, Mc Graw Hill Education.
8. Tiwari, R. C.: Geography of India, Prayag Pustak Bhawan, Allahabad.

Mapping of Course Outcomes to Program Outcomes (Geography of India)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-102.1	3.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0	3.0	1.0	1.0
M-GEO-102.2	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-102.3	3.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0	3.0	1.0	1.0
M-GEO-102.4	3.0	1.0	2.0	2.0	2.0	1.0	1.0	2.0	3.0	1.0	1.0
Average	3.0	1.3	2.0	1.8	2.0	1.3	1.3	1.5	3.0	1.0	1.3

Mapping of Course Outcomes to Program Specific Outcomes (Geography of India)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-102.1	3.0	1.0	1.0	1.0
M-GEO-102.2	3.0	1.0	2.0	2.0
M-GEO-102.3	3.0	1.0	2.0	2.0
M-GEO-102.4	3.0	1.0	2.0	2.0
Average	3.0	1.0	1.8	1.8

Semester-I
Core Course Code: M-GEO-103
Core Course Name: Economic Geography

Time: 3 Hours

Credits: 4

Total Marks

: 100

External Assessment Marks

: 70

Internal Assessment Marks

: 30

Course Outcomes (COs):

M-GEO-103.1: Provides understanding about the location and distribution of economic activities.

M-GEO-103.2: Familiarization with location theories of economic activities.

M-GEO-103.3: Acquaintance with the spatial organization of world economies.

M-GEO-103.4: Knowledge about trade blocs, trends in trade and various processes of globalization.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Definition, nature, scope, importance, recent trends and approaches in economic geography.
2. Relationship of economic geography with economics.
3. Economic activities and their classification.

UNIT-II

4. Network structure and economic activities, impact of transport on economic activities, spatial variation in production and transport cost.
5. Location theories of Weber, Losch, Christaller, Ullman and Krugman.

UNIT-III

6. World Economies: bases of classification, patterns and characteristics of developed and developing economies of the world.
7. Economic development: meaning, evolution, goals, measures, patterns, problems and theories.

UNIT-IV

8. Globalization and recent trends in pattern of international trade.
9. Emergence of a new global economy-transnational integration and its spatial outcomes.
10. Major regional trade blocks of the world, free trade initiatives (GATT, UNCTAD, WTO).

Suggested Readings:

1. Gautam, A. 2010. Advanced Economic Geography. Sharda Pustak Bhawan, Allhabad.
2. Hartshorne, T. A. and Alexander, J. W. 2001. Economic Geography. Prentice Hall of India. New Delhi.
3. Hudson, R. 2005. Economic Geography. Sage Publication, New Delhi.
4. Jones, C. F. and Darkenwarld, G. G. Economic Geography. The Macmillan and Company. New York.
5. Knox, P. 2003. The Geography of World Economy. Arnold, London.
6. Saxena, H.M. 2013. Economic Geography. Rawat Publications, Jaipur.
7. Wheeler, J.O. and Muller, P.O. 1985. Economic Geography. John Wiley and Sons. New York.

Mapping of Course Outcomes to Program Outcomes (Economic Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-103.1	3.0	3.0	3.0	1.0	3.0	2.0	1.0	3.0	3.0	2.0	3.0
M-GEO-103.2	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0
M-GEO-103.3	3.0	3.0	3.0	3.0	3.0	2.0	1.0	3.0	3.0	1.0	3.0
M-GEO-103.4	3.0	2.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	2.0	3.0
Average	3.0	2.8	3.0	2.3	3.0	2.5	1.3	3.0	3.0	1.5	3.0

Mapping of Course Outcomes to Program Specific Outcomes (Economic Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-103.1	3.0	3.0	2.0	3.0
M-GEO-103.2	3.0	3.0	2.0	3.0
M-GEO-103.3	3.0	3.0	3.0	3.0
M-GEO-103.4	3.0	3.0	2.0	3.0
Average	3.0	3.0	2.3	3.0

Semester-I
Core Course Code: M-GEO-104
Core Course Name: Statistical Methods in Geography

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-104.1: Introduction to tools of quantitative information and data.

M-GEO-104.2: Enhancement of knowledge about statistical analysis of spatial pattern from geographical data.

M-GEO-104.3: Enrichment of knowledge about inferential data analysis and errors associated with it.

M-GEO-104.4: Acquaintance with bivariate and multivariate analytical techniques.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Descriptive statistics: histogram and frequency curve, measures of central tendency: mean, median, mode, Partitioned values: quartiles and deciles, comparison of mean, median and mode
2. Measures of dispersion: absolute measures: range, quartile deviation, mean deviation, standard deviation, relative measure of dispersion: coefficient of variation

UNIT-II

3. Normal curve as a probability distribution: characteristics and area under curve
4. Measure of inequality: location quotient and Lorenz curve.
5. Sampling: theory, methods, distribution and chance errors.

UNIT-III

6. Bivariate analysis: scatter diagram, correlation analysis, Spearman's rank correlation and Karl Pearson's correlation coefficient, test of significance.
7. Simple linear regression model: properties of least square estimate, coefficient of determination

UNIT-IV

8. Residuals and their mapping
9. Basics of multivariate analysis: correlation matrix, partial and multiple correlation

Suggested Readings:

1. Gregory, S. Statistical Methods and the Geographers, Longman, London, 1964.
2. Gupta, C. B. An Introduction to Statistical Methods, Vikas Publishing House, Delhi, 1974.
3. Johnston, R.J. Multivariate Statistical Analysis in Geography, Longman Scientific and Technical, John Wiley & Sons, 1989.
4. Mahmood, A. Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi, 1993.
5. Paul, S.K. Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi, 1998.
6. Houshmand, A.R. Statistical Methods for Environmental and Agricultural Sciences, CRC Press, New York, 1998.
7. Levin, J and Fox, J.A. Elementary Statistics in Social Research, Pearson Education, New Delhi, 2006.
8. Rogerson. P.A. Statistical Methods for Geography, Sage Publication, New Delhi, 2010.
9. Sarkar, A. Quantitative Geography: Techniques and Presentations. 2013.

Mapping of Course Outcomes to Program Outcomes (Statistical Methods in Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-104.1	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0	3.0
M-GEO-104.2	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0
M-GEO-104.3	3.0	3.0	2.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0	1.0
M-GEO-104.4	3.0	3.0	3.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0	2.0
Average	3.0	3.0	2.5	3.0	1.5	3.0	3.0	3.0	2.3	2.3	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Statistical Methods in Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-104.1	2.0	3.0	3.0	3.0
M-GEO-104.2	3.0	3.0	3.0	3.0
M-GEO-104.3	2.0	3.0	3.0	3.0
M-GEO-104.4	2.0	3.0	3.0	3.0
Average	2.3	3.0	3.0	3.0

Semester-I
Core Course Code: M-GEO-105
Core Course Name: Cartographic Methods in Geography (Theory)

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 35
Internal Assessment Marks : 15

Course Outcomes (COs):

M-GEO-105.1: Provides understanding about the basic concepts of cartography.

M-GEO-105.2: Enhancement of skills to prepare thematic maps and diagrams.

M-GEO-105.3: Acquaintance with representation of statistical data in the form of diagrams.

M-GEO-105.4: Ability to represent and interpret climatic data using diagrams.

Note for Paper Setters: Question 1 is compulsory comprising of four sub parts (two marks for each sub part), to be answered in 25-30 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. Question 1 carries eight marks. Long questions carry nine marks each.

UNIT-I

1. Nature and scope of Cartography.
2. Recent advancements in cartography.
3. Types and characteristics of distribution maps: (i) Chorochromatic (ii) Choroschematic (iii) Isopleths (iv) Choropleth (v) Dot and (vi) Diagrammatic.

UNIT-II

4. Types and characteristics of statistical diagrams: (i) One dimensional (bar, line), (ii) Two dimensional (circular, rectangular, square), (iii) Three dimensional (block, sphere, cube) and (iv) Other diagrams (Snail, pyramid, flow diagram/cartogram).
5. Characteristics of graph/diagrams/maps representing climatic data: (i) Rainfall deviation, (ii) Climograph (Taylor and Foster), (iii) Hythergraph, (iv) Star/Wind rose diagram (v) Isopleths (vi) Line and bar (vii) polygraph.

Suggested Readings:

1. Misra, R.P. and Ramesh, A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi
2. Monkhouse, F.J. and Wilkinson, H.R. 1980. Maps and Diagrams. B. I. Publications, New Delhi.
3. Singh, R. L. 1986. Elements of Practical Geography. Kalyani Publishers, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Cartographic Methods in Geography-Theory)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-105.1	3.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-105.2	3.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-105.3	3.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-105.4	3.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
Average	3.0	2.0	2.0	3.0	1.8	2.0	2.0	2.0	3.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Cartographic Methods in Geography-Theory)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-105.1	3.0	1.0	3.0	3.0
M-GEO-105.2	3.0	1.0	3.0	3.0
M-GEO-105.3	3.0	1.0	3.0	3.0
M-GEO-105.4	3.0	1.0	3.0	3.0
Average	3.0	1.0	3.0	3.0

Semester-I
Core Course Code: M-GEO-106
Core Course Name: Cartographic Methods in Geography (Practical)

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-106.1: Awareness about various types of cartographic diagrams.

M-GEO-106.2: Enrichment of skillsto prepare the thematic maps and diagrams.

M-GEO-106.3:Acquisition of skills to represent the statistical data.

M-GEO-106.4:Capability to understand and interpret the graphs/diagrams/maps.

Note for Paper Setters: The examiner shall set four questions, two from each unit. The candidate shall attemptthree questions in all, selecting at least one questionfrom each unit.

Distribution of Marks for Evaluation

Exercise = 45

File Record = 10

Viva-voce = 15

UNIT-I

1. Simple Diagrams:

- | | |
|-------------------------------|------------|
| a) Line and bar graph | 1 exercise |
| b) Poly graph | 1 exercise |
| c) Rainfall deviation diagram | 1 exercise |

2. One dimensional diagrams:

- | | |
|--------------------|------------|
| a) Simple | 1 exercise |
| b) Comparative bar | 1 exercise |
| c) Compound bar | 1 exercise |
| d) Trend graph | 1 exercise |

3.Two dimensional diagrams:

- | | |
|------------------------|------------|
| a) Pie diagram | 1 exercise |
| b) Proportional circle | 1 exercise |

4. Three dimensional diagrams:

- | | |
|-----------|------------|
| a) Sphere | 1 exercise |
|-----------|------------|

5.Weather Diagrams:

- | | |
|-----------------------------------|------------|
| a) Climograph (Taylor and Foster) | 2 exercise |
| b) Hythergraph | 1 exercise |
| c) Ergograph | 1 exercise |
| d) Wind rose diagram | 1 exercise |
| e) Isopleth | 1 exercise |

UNIT-II

6.Distribution maps:

- | | |
|----------------------------|------------|
| a) Dot method | 1 exercise |
| b) Choropleth- Monovariate | 4 exercise |
| c) Choropleth- Bivariate | 2 exercise |

7. Diagrams:

- | | |
|--|------------|
| a) Age and Sex pyramid | 1 exercise |
| b) Snail Diagram | 1 exercise |
| c) Cartogram (rectangular, traffic flow) | 2 exercise |

Suggested Readings:

1. Misra, R.P. and Ramesh, A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi
2. Monkhouse, F.J. and Wilkinson, H.R. 1980. Maps and Diagrams. B. I. Publications, New Delhi.
3. Singh, R. L. 1986. Elements of Practical Geography. Kalyani Publishers, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Cartographic Methods in Geography-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-106.1	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-106.2	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-106.3	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-106.4	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
Average	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Cartographic Methods in Geography-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-106.1	3.0	1.0	3.0	3.0
M-GEO-106.2	3.0	1.0	3.0	3.0
M-GEO-106.3	3.0	1.0	3.0	3.0
M-GEO-106.4	3.0	1.0	3.0	3.0
Average	3.0	1.0	3.0	3.0

Semester-II
Core Course Code: M-GEO-201
Core Course Name: Geomorphology

Time: 3 Hours

Credits: 4

Total Marks : 100

External Assessment Marks : 70

Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-201.1: Development of understanding about the fundamental concepts of geomorphology.

M-GEO-201.2: Enrichment of knowledge about tectonic activities and hill slope relationship.

M-GEO-201.3: Familiarization with the processes and patterns shaping the landforms.

M-GEO-201.4: Understanding of environmental management using principles of applied geomorphology.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Introduction to geomorphology as a science: definition, nature, scope and recent developments.
2. Fundamental concepts: geological structure and landforms, uniformitarianism, multi-cycle and polygenetic evolution of landscape, frequency concept of geomorphic processes, climatogenetic geomorphology and pediplain and pediplain.

UNIT-II

3. Continental drift theory and its basic considerations; Plate tectonics-meaning and concept, margins and boundaries, plate motion and cycle; Tectonic activities along boundaries and distribution of plates.
4. Hill slope-definition and forms of slope, geomorphic processes and slope forms, theories of slope evolution by Davis, Penck, Strahler, Young, Wood and King.

UNIT-III

5. Weathering: Causes; types of weathering: physical, chemical and biological.
6. Mass movement, causes, classifications and types of mass movements- slow and rapid mass movements.

UNIT-IV

7. Geomorphic processes and resulting land forms: Fluvial, Glacial, Periglacial, Aeolian and Karst
8. Applied geomorphology: meaning and concept, role of geomorphology in environmental management of the following: (i) accelerated erosion and sedimentation, (ii) construction of large dams (iii) urban floods.

Suggested Readings:

1. Bloom AL. 2002. Geomorphology: A systematic Analysis of late Cenozoic landforms. Prentice-Hall Private Limited, New Delhi.
2. Embleton, C and Thomne. J. 1979. Process in Geomorphology. London, Edward Arnold.
3. Kale VS and Gupta A. 2001. Introduction to Geomorphology. Orient Longman, Hyderabad.
4. Ritter DF., Kochel RC. and Miller JR. 1995. Process Geomorphology. Dubuque, WinC. Brown Publishers.
5. Sharma HS and Kale VS 2009. Geomorphology in India, Prayag Pustak Bhawan, Allahabad.
6. Sharma, VK. 2010. Introduction to Process Geomorphology. Tayler and Francis's, London.
7. Sharma, VK. 1992. Earth's Surface Processes and Forms. Tata McGraw Hill Publications, New Delhi.
8. Singh S. 2002. Geomorphology, Prayag Pustak Bhawan, Allahabad.
9. Strahler AH. 2013. Introducing Physical Geography, Wiley and Sons, New York.
10. Thornbury, WD. 2004. Principles of Geomorphology, John Wiley Sons, New York.

Mapping of Course Outcomes to Program Outcomes (Geomorphology)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-201.1	3.0	3.0	3.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0
M-GEO-201.2	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	1.0	2.0
M-GEO-201.3	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0
M-GEO-201.4	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	1.0	3.0
Average	3.0	3.0	3.0	3.0	2.0	3.0	2.5	2.8	3.0	1.5	2.5

Mapping of Course Outcomes to Program Specific Outcomes (Geomorphology)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-201.1	3.0	2.0	1.0	3.0
M-GEO-201.2	3.0	2.0	1.0	3.0
M-GEO-201.3	3.0	2.0	3.0	3.0
M-GEO-201.4	3.0	3.0	2.0	3.0
Average	3.0	2.3	1.8	3.0

Semester-II
Core Course Code: M-GEO-202
Core Course Name: Population Geography

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-202.1: Knowledge about population data base, methodological issues and mapping.

M-GEO-202.2: Familiarization with the dynamics of population and demographic dividends.

M-GEO-202.3: Enrichment of knowledge about population theories and models.

M-GEO-202.4: Awareness about population policies of different countries and relation between population and environment.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Nature and scope of population geography.
2. Methodological problems in population geography.
3. Sources of population data, quality and reliability of data.
4. Problems of mapping population data.

UNIT-II

5. Concepts, determinants and world patterns of the following attributes of population:
 - (i) Dynamics of population: fertility, mortality, migration (including policies) and growth.
 - (ii) Composition of population: age and sex composition, ageing of population, occupational structure and workforce.
6. Demographic dividend: linkages between population and economic development.

UNIT-III

7. Concepts of over population, under population and optimum population.
8. Demographic transition model.
9. Population resource regions.
10. Theories of population: Malthus, Ricardo and Marx.
11. Limits to growth: concept and application.

UNIT-IV

12. Comparative study of population problems and policies of developed and less developed countries.
 - (i) Developed world: U.S.A., Japan, Canada.
 - (ii) Less developed world: India, China and Brazil.
13. Population problems and environmental implications.

Suggested Readings:

1. Bhende, A. A. and Kanitkar, T. (2011): Principles of Population Studies, Himalaya Publishing House, Mumbai.
2. Cassen, Robert & Bates, Lisa M. (1994): Population Policy: A New Consensus Overseas Development Council, Washington, D.C.
3. Chandna, R. C. (2016): Population Geography: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi.
4. Demko, G. J. and others (Eds.) (1971): Population Geography, Reader, McGraw- Hill Books Co., New York
5. Graff, M., and Bremner, J. (2014): A Practical Guide to Population and Development, Washington DC: Population Reference Bureau.
6. Hassan, I. (2020) Population Geography: A Systematic Exposition, Routledge, London.
7. May, J.F. (2012) World population policies: their origin, evolution, and impact, Washington DC: Springer.
8. Mahajan, N. (2014) Population Geography, R.K. publishers, Delhi.
9. Murray C. J. L., J. A. Salomon, C. D. Mathers and A. D. Lopez (), Summary Measures of Population Health: Concepts, Ethics, Measurement and Applications. WHO, Geneva.
10. Newbold, K Bruce (2016) Population geography: Tools and Issues.
11. Qazi, S.A (2010). Population Geography, APH publishers.

12. Trewartha, G. T. (1972): The Less Developed Realm-A Geography of its Population, John Wiley & Sons, Inc., New York.
13. Trewartha, G. T. (1978): The More Developed Realm-A Geography of its Population Pergamon Press, New York.
14. Woods, R. (1979): Population Analysis in Geography, Longman, London.
15. United Nations (1997): Health and Mortality Issues of Global Concern, Proceeding of the Symposium on Health and Mortality, Brussels, 19-22 November 1997.

Mapping of Course Outcomes to Program Outcomes (Population Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-202.1	3.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-202.2	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	1.0	2.0
M-GEO-202.3	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	1.0	2.0
M-GEO-202.4	3.0	2.0	3.0	3.0	2.0	2.0	1.0	2.0	3.0	1.0	2.0
Average	3.0	2.5	3.0	2.8	2.0	2.5	2.0	2.5	3.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Population Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-202.1	3.0	1.0	3.0	3.0
M-GEO-202.2	3.0	1.0	3.0	1.0
M-GEO-202.3	3.0	1.0	2.0	1.0
M-GEO-202.4	3.0	1.0	3.0	3.0
Average	3.0	1.0	2.8	2.0

Semester-II
Core Course Code: M-GEO-203
Core Course Name: Regional Development and Planning with Special Reference to India

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-203.1: Understanding of basic concepts of regional planning and development.

M-GEO-203.2: Acquaintance with models of regional development.

M-GEO-203.3: Enrichment of knowledge about regional disparities and challenges in India.

M-GEO-203.4: Awareness about developmental plans and strategies in India.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Concept of regional development, regional disparities, balanced regional development
2. Region and its typology
3. Basis of regionalization in India and their characteristics.

UNIT-II

4. Theories of regional development:
 - (i) Trickle Down Theory
 - (ii) Growth Pole Theory
 - (iii) Cumulative causation Model
 - (iv) Core-Periphery Theory
5. Concept of sustainable development, inclusive growth and eco-feminism

UNIT-III

6. Development and regional disparities in India since Independence:
 - (i) Disparities in Agricultural Development
 - (ii) Disparities in Industrial Development.
7. Disparities in human resource development in terms of poverty, education and health

UNIT-IV

8. India through Planned Era with special reference to:
 - (i) Tribal area development plan
 - (ii) Hill Area development plan
 - (iii) Desert, drought prone and backward area development plan
9. NitiAyog: aims and objectives
10. Urban planning in India with special reference to National Capital Region

Suggested Readings:

1. Chandna, R.C. (2000): Regional Planning: A Comprehensive Text. Kalyani Publishers, New Delhi.
2. Chaudhuri, J.R. (2001): An Introduction to Development and Regional Planning with special reference to India. Orient Longman, Hyderabad.
3. Friedmann, J. and Alonso, W. (1973): Regional Development and Planning. The MIT Press, Mass.
4. Hettne, B., Inotai, A. and Sunkel, O. (2000): Studies in the New Regionalism. Vol. I-V. Macmillan Press, London.
5. Kuklinski, A.R. (1972): Growth Poles and Growth Centres in Regional Planning. Mouton and Co., Paris.
6. Leys, C. (1996): The Rise and Fall of Development Theory. Indian University Press, Bloomington.
7. Mahapatra, A.C. and Pathak, C.R. (2003): Economic Liberalization and Regional Disparities in India. Star Publishing House, Shillong.
8. Chand, M and Puri, V.K. (1983): Regional Planning in India, Allied Publishers, New Delhi.
9. Misra, R.P. (1992): Regional Planning: Concepts, Techniques, Policies and Case Studies. Concept Publishing Company, New Delhi.
10. Misra, R.P. and Natraj, V.K. (1978): Regional Planning and National Development. Vikas Publication, New Delhi.
11. Sundaram K V (1986): Urban and Regional Planning in India, Vikas Publishing House, New Delhi
12. Raza Moonis (1988): Regional Development Vol. 10, Contribution to Indian Geography Heritage Publishers, New Delhi.

13. Kundu and Moonis Raza (1988): Indian Economy: The Regional Dimension, CSRD/SSS, JNU. New Delhi.
14. Patnaik, C. S. (1981): Economics of Regional Development and Planning in Third World Countries, Associate Publishing House, New Delhi.

**Mapping of Course Outcomes to Program Outcomes
(Regional Development and Planning with Special Reference to India)**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-203.1	3.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0	2.0
M-GEO-203.2	3.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	1.0
M-GEO-203.3	3.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	1.0
M-GEO-203.4	3.0	3.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0
Average	3.0	3.0	2.0	2.8	2.0	2.8	2.0	3.0	3.0	2.8	2.0

**Mapping of Course Outcomes to Program Specific Outcomes
(Regional Development and Planning with special reference to India)**

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-203.1	3.0	2.0	3.0	3.0
M-GEO-203.2	3.0	3.0	3.0	3.0
M-GEO-203.3	3.0	2.0	3.0	3.0
M-GEO-203.4	2.0	2.0	3.0	3.0
Average	2.8	2.3	3.0	3.0

Semester-II
Core Course Code: M-GEO-204
Core Course Name: Agricultural Geography with Special Reference to India

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-204.1: Enrichment of knowledge about origin, location and distribution of agricultural activities.

M-GEO-204.2: Enhancement of knowledge about changing land use and cropping pattern.

M-GEO-204.3: Acquaintance with agricultural systems, efficiency and productivity.

M-GEO-204.4: Awareness about impacts of climate change and economic liberalization on agriculture.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Nature, scope and significance of agricultural geography.
2. Origin and dispersal of agriculture in the World.
3. Determinants of agricultural patterns: physical, technological and cultural factors

UNIT-II

4. Concepts of land capability survey, land use and cropping pattern.
5. Agricultural Concepts: intensity of cropping, Degree of commercialization, Cropping diversification and concentration, Crop combination, Contract farming and agri-business.
6. Approaches in agricultural regionalization: Von Thunen Model of agricultural land use, Agro-climatic zonation: Concept and Indian experience.

UNIT-III

7. Bases of identification of agricultural systems by Whittlesey and agricultural typology by Kostrowiki.
8. Measurements of agricultural efficiency and productivity.
9. Green revolution: Its impacts and consequences in India.

UNIT-IV

10. Food production and security in India.
11. Neo-liberalization and Indian agriculture.
12. Agriculture and climate change: impacts and adaptation.

Suggested Readings:

1. Bowler TR (1992) The Geography of Agriculture in Developed Market Economics. Longman.
2. Geoffrey, H.F.(1970) Geography of Agriculture: Themes in Research. Practice Hall, N.J.
3. Grigg D (1995) Introduction to Agricultural Geography. Routledge, London.
4. Husain, Majid (1996) Systematic Agricultural Geography. Rawat Publications, Jaipur.
5. Morgon, W.B. and Munton, R.J.C.(1971) Agricultural Geography. Methuen, London.
6. Singh Jasbir and Dhillon S.S. (1994) Agricultural Geography. Tata Mc Graw Hill, New Delhi.
7. Safi, Mohammad (2007) Agricultural Geography. Prentice-Hall of India.
8. Singh Jasbir (1989) Agricultural Geography.
9. Symons, Leslic (1967): Agricultural Geography, G. Bell and Sons, London.
10. Tarrant, J.R. (1974) Agricultural Geography, Wiley, New York.

Mapping of Course Outcomes to Program Outcomes
(Agricultural Geography with Special Reference to India)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-204.1	3.0	2.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	1.0
M-GEO-204.2	3.0	3.0	2.0	3.0	1.0	3.0	3.0	3.0	3.0	2.0	2.0
M-GEO-204.3	3.0	3.0	1.0	3.0	1.0	3.0	3.0	3.0	3.0	2.0	2.0
M-GEO-204.4	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	2.0
Average	3.0	2.8	2.0	3.0	1.5	3.0	2.5	3.0	3.0	2.3	1.8

Mapping of Course Outcomes to Program Specific Outcomes
(Agricultural Geography with Special Reference to India)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-204.1	3.0	2.0	2.0	3.0
M-GEO-204.2	3.0	3.0	3.0	3.0
M-GEO-204.3	3.0	2.0	3.0	2.0
M-GEO-204.4	3.0	3.0	3.0	3.0
Average	3.0	2.5	2.8	2.8

Semester-II
Core Course Code: M-GEO-205
Core Course Name: Morphometric Analysis (Theory)

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 35
Internal Assessment Marks : 15

Course Outcomes (COs):

M-GEO-205.1: Familiarization with arrangement, identification and interpretation of topographical sheets.

M-GEO-205.2: Acquaintance with the concept of drainage basin and its linear and areal properties.

M-GEO-205.3: Provides understanding about relief aspects of drainage basin.

M-GEO-205.4: Development of understanding about slope and various methods of its analysis.

Note for Paper Setters: Question 1 is compulsory comprising of four sub parts (two marks for each sub part), to be answered in 25-30 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. Question 1 carries eight marks. Long questions carry nine marks each.

UNIT-I

1. Arrangement, identification and interpretation of topographical sheets of India.
2. Delineation of drainage basin and its geographical significance.
3. Profile: Transverse and longitudinal.
4. Drainage network analysis: Linear and areal properties.
5. Relationship between stream order, number and length.

UNIT-II

6. Relief aspect of drainage basin:
 - (i) Area-height curve,
 - (ii) Altimetric frequency curve,
 - (iii) Hypsographic curve,
 - (iv) Hypsometric integral curve
 - (v) Clinographic curve.
7. Development of slope and various methods of its analysis (Wentworth and Smith's method).

Suggested Readings:

1. Dury, G.H. 1966. Essays in Geomorphology. Heinmann, London.
2. Misra, R.P. and Ramesh, A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
3. Miller, A. 1964. The Skin of the Earth. Methuen, London
4. Monkhouse, F. J. and Wilkinson, H.R. 1980. Maps and Diagrams. B.I. Publications, New Delhi.
5. Singh, R. L. 1986. Elements of Practical Geography, Kalyani Publications, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Morphometric Analysis-Theory)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-205.1	3.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	3.0	1.0	3.0
M-GEO-205.2	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	3.0
M-GEO-205.3	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	1.0	3.0
M-GEO-205.4	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	3.0
Average	3.0	2.8	2.8	2.5	1.8	2.5	1.8	2.5	3.0	1.5	3.0

Mapping of Course Outcomes to Program Specific Outcomes (Morphometric Analysis-Theory)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-205.1	3.0	1.0	1.0	2.0
M-GEO-205.2	3.0	3.0	3.0	3.0
M-GEO-205.3	3.0	3.0	3.0	3.0
M-GEO-205.4	3.0	3.0	3.0	3.0
Average	3.0	2.5	2.5	2.8

Semester-II
Core Course Code: M-GEO-206
Core Course Name: Morphometric Analysis (Practical)

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-206.1: Acquisition of skills to extract physical and cultural information from topographical maps.

M-GEO-206.2: Knowledge of drawing of transverse and longitudinal profiles.

M-GEO-206.3: Ability to represent the linear, areal and relief aspects of drainage basin.

M-GEO-206.4: Capability to prepare the slope and relative relief maps of drainage basin.

Note for Paper Setters: The examiner shall set four questions, two from each unit. The candidate shall attempt three questions in all, selecting at least one question from each unit.

Distribution of Marks for Evaluation

Exercise = 45 File Record = 10 Viva-voce = 15

UNIT-I

- | | |
|--|------------|
| 1. Representation of physical features | 1 exercise |
| 2. Representation of cultural features | 1 exercise |
| 3. Delineation of watershed (All exercises shall be based on it) | 1 exercise |
| 4. Profile analysis: transverse and longitudinal | |
| a) Serial profiles | 1 exercise |
| b) Superimposed profiles | 1 exercise |
| c) Composite profiles | 1 exercise |
| d) Projected profiles | 1 exercise |
| e) Longitudinal or valley Thalweg profile | 1 exercise |
| 5. Linear Aspects: | |
| a) Relationship between stream order and stream Number | 1 exercise |
| b) Relationship between stream order and average stream length | 1 exercise |
| c) Bifurcation ratio | 1 exercise |
| 6. Areal Aspects: | |
| a) Drainage frequency | 1 exercise |
| b) Drainage Density | 1 exercise |

UNIT-II

- | | |
|--|------------|
| 6. Relief Aspect: | |
| a) Area height Curve | 1 exercise |
| b) Altimetric frequency curve | 1 exercise |
| c) Hypsographic curve | 1 exercise |
| d) Hypsometric integral curve | 1 exercise |
| e) Clinographic curve | 1 exercise |
| 7. Slope Analysis: | |
| a) Wentworth's method of average slope | 1 exercise |
| b) G. H. Smith's method of relative relief | 1 exercise |

Suggested Readings

1. Dury, G.H. 1966. Essays in Geomorphology. Heinmann, London.
2. Misra, R.P. and Ramesh, A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
3. Miller, A. 1964. The Skin of the Earth. Methuen, London
4. Monkhouse, F. J. and Wilkinson, H.R. 1980. Maps and Diagrams. B.I. Publications, New Delhi.
5. Singh, R. L. 1986. Elements of Practical Geography, Kalyani Publications, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Morphometric Analysis-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-206.1	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	3.0
M-GEO-206.2	3.0	3.0	3.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0
M-GEO-206.3	3.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	1.0	3.0
M-GEO-206.4	3.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	1.0	3.0
Average	3.0	3.0	3.0	3.0	2.0	3.0	2.5	2.3	3.0	1.8	3.0

Mapping of Course Outcomes to Program Specific Outcomes (Morphometric Analysis-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-206.1	3.0	1.0	3.0	2.0
M-GEO-206.2	3.0	2.0	3.0	2.0
M-GEO-206.3	3.0	3.0	3.0	3.0
M-GEO-206.4	3.0	3.0	3.0	3.0
Average	3.0	2.3	3.0	2.5

Semester-II
Open Elective Course Code: M-GEO-OE-204
Open Elective Course Name: General Geography of India

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 35
Internal Assessment Marks : 15

Course Outcomes (COs):

M-GEO-OE-204.1: Understanding of location and geographical expansion of India.

M-GEO-OE-204.2: Acquaintance with the geophysical structure of India.

M-GEO-OE-204.3: Enrichment of knowledge about peopling and distribution of population.

M-GEO-OE-204.4: Capability to understand the regional diversity and unity in India.

Note for Paper Setters: Question 1 is compulsory comprising of four sub parts (two marks for each sub part), to be answered in 25-30 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. Question 1 carries eight marks. Long questions carry nine marks each.

UNIT-I

1. India: locational setting and geographical expansion
2. Relief and drainage systems.
3. Climate, soil and natural vegetation.
4. Physiographic regions of India

UNIT-II

5. The Peopling of India
6. Population: distribution, density and growth
7. Population composition: ethnic and socio-cultural attributes (caste and tribes)
8. Unity in diversity in India

Suggested Readings:

1. Ahmed, A, India: A General Geography, NCERT, New Delhi.
2. Hussain, Majid Geography of India, McGraw Hill Education Series
3. Qureshi, M. H. India: People and Economy, NCERT, New Delhi.
4. Qureshi, M.H. India: Physical Environment, NCERT, New Delhi.
5. Singh, S. and Saroha, J. 2019. Geography of India, Mc Graw Hill Education.
6. Tiwari, RC, Geography of India, PrayagPustak Bhawan, Allahabad.

Mapping of Course Outcomes to Program Outcomes (General Geography of India)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-OE-204.1	3.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	3.0	2.0	2.0
M-GEO-OE-204.2	3.0	2.0	1.0	1.0	1.0	2.0	1.0	3.0	3.0	2.0	2.0
M-GEO-OE-204.3	3.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	2.0	2.0	2.0
M-GEO-OE-204.4	3.0	2.0	2.0	2.0	3.0	2.0	1.0	3.0	3.0	2.0	2.0
Average	3.0	1.8	1.8	1.5	2.0	1.8	1.5	2.8	2.8	2.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (General Geography of India)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-OE-204.1	3.0	1.0	1.0	1.0
M-GEO-OE-204.2	3.0	1.0	2.0	3.0
M-GEO-OE-204.3	3.0	1.0	2.0	2.0
M-GEO-OE-204.4	3.0	1.0	2.0	2.0
Average	3.0	1.0	1.8	2.0

Semester-III
Core Course Code: M-GEO-301
Core Course Name: Geography and Ecosystems

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

- M-GEO-301.1:** Familiarization with the concept and elements of ecosystem.
M-GEO-301.2: Enrichment of knowledge about the characteristics of different biomes.
M-GEO-301.3: Awareness about the inter-linkages between human artifacts and natural environment.
M-GEO-301.4: Acquaintance about world environmental problems and policy framework.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Geography and ecosystem: fundamental concepts.
2. Concept of ecosystem: bases, types, components and function of ecosystem.
3. Energy flow in ecosystem: food chain, food web, trophic levels, ecological production and ecological pyramids.
4. Biogeochemical cycles: hydrological, carbon, oxygen and nitrogen cycles.

UNIT-II

5. Biome: scheme of classification: factors affecting the distribution of biomes.
6. Salient features of the following biomes:
 - a. Tropical evergreen rain forest biome
 - b. Savanna biome
 - c. Monsoon biome
 - d. Temperate biome
 - e. Marine biome
 - f. Mountain biome
 - g. Desert biome
7. Ecosystem approach and its relevance in geography.

UNIT-III

8. Man-environment relationship: classification of resources; use and ecological imbalance with reference to soils, forests and energy resources.
9. Concept of air, water, and noise pollution: level of problem, causes and measurement tools.
10. Biodiversity and conservation: preservation and conservation of ecosystem through resource management.

UNIT- IV

11. Environmental issues: climate change, ozone depletion, global warming and global cooling
12. International efforts for environment management and conservation: The Stockholm Conference, the Earth Summit, Kyoto Protocol, Paris declaration and after.
13. Environment Governance: environment policies and environmental legislation in India: prevention & protection Act of wild life, water, air, forest, environment protection and National Environment Tribunal Act.

Suggested Readings:

1. Agarwal, A. and Sen, S. The Citizens Fifth Report. Centre for Science and Environment New Delhi 1999.
2. Bertalanffy, L. General Systems Theory, George Bragiller, New York, 1958.
3. Bodkin, E. Environmental Studies, Charles E. Merrill Pub Co., Columbus, Ohio, 1982.
4. Chandna, R.C.: Environmental Awareness, Kalyani Publishers, New Delhi, 1998.
5. Chorley, R.J., Geomorphology and General Systems Theory, U.S.G.S. Professional Paper, 500B, 1962.
6. Eyre, S.R. and Jones, G.R.J. Geography as Human Ecology, Edward Arnold, London, 1966.
7. Kormondy, E.J. Concepts of Ecology, Prentice Hall, 1989.
8. Mishra, S.P. and Pandey, S.N. (2016) Essential Environmental studies, Ane publications New Delhi.
9. Nobel and Wright: Environmental Science, Prentice Hall, New York 1996.
10. Odum, E.P. Fundamentals of Ecology, W.B. Saunders, Philadelphia, 1971.
11. Russwurm, L.H. and Sommerville, E. Man's Natural Environment-A systems Approach, Duxbury, Massachusetts, 1985.
12. Sharma, H.S. Ranthambhore Sanctuary-Dilemma of Eco-development, Concept, New Delhi, 2000.

13. Simmons, I.G. Ecology of Natural Resources, Edward Arnold, London, 1981.
14. Singh, S. Environmental Geography, Prayag Publications, Allahabad, 1991.
15. Smith, R.L. Man and his Environment: An Ecosystem Approach, Harper & Row, London, 1992.
16. World Watch Institute: State of the World, Latest Report, Washington, D.C.

Mapping of Course Outcomes to Program Outcomes (Geography and Ecosystems)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-301.1	3.0	1.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	1.0	2.0
M-GEO-301.2	3.0	2.0	3.0	3.0	2.0	2.0	1.0	2.0	3.0	1.0	2.0
M-GEO-301.3	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-301.4	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
Average	3.0	1.0	3.0	2.8	2.0	2.0	1.5	2.0	3.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Geography and Ecosystems)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-301.1	3.0	1.0	1.0	3.0
M-GEO-301.2	3.0	1.0	2.0	3.0
M-GEO-301.3	3.0	1.0	2.0	3.0
M-GEO-301.4	3.0	1.0	2.0	3.0
Average	3.0	1.0	1.8	3.0

Semester-III
Core Course Code: M-GEO-302
Core Course Name: Field Methods in Geography (Socio-economic) (Theory)

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 35
Internal Assessment Marks : 15

Course Outcomes (COs):

- M-GEO-302.1:** Realization of importance of fieldwork in learning geography.
M-GEO-302.2: Ability to identify research problem and formulation of research design.
M-GEO-302.3: Learning the techniques of socio-economic data collection through surveys.
M-GEO-302.4: Enhancement of skills about retrieval, analysis of data and preparation of field report.

Note for Paper Setters: Question 1 is compulsory comprising of four sub parts (two marks for each sub part), to be answered in 25-30 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. Question 1 carries eight marks. Long questions carry nine marks each.

UNIT-I

1. Significance of field work in Geography.
2. Identification of research problem and formulation of research design in geography.
3. Types and sources of data: characteristics of primary and secondary data.
4. Types of questionnaires and their formulation.

UNIT-II

5. Sample design for collection of socio-economic data.
6. Collection of demographic and socio-economic data from the field.
7. Retrieval and analysis of data collected from field.
8. Format of field project report writing.

Suggested Readings:

1. Black James A and D.J. Champion (1976): Methods and Issues in Social Research, New York, John Wiley and Sons, Inc.
2. Goode and Hatt, Research Methodology in Social Sciences, Oxford University Press, New Delhi.
3. Gomez B and John Paul Jones. 2010. Research Methods in Geography-A Critical Introduction. Wiley Blackwell Publications, Singapore.
4. Har Prasad (1992) Research Methods and Techniques in Geography, Rawat Publishers, Jaipur.
5. Kundu A. Measurement of Urban Processes: A Study of Regionalization, Popular Prakashan, Mumbai.
6. Mishra, H.N. and Singh V.P.(1998) Research Methodology: Social, Spatial and Policy Dimensions, Rawat Publishers, Jaipur.

**Mapping of Course Outcomes to Program Outcomes
(Field Methods in Geography (Socio-economic)-Theory)**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-302.1	3.0	3.0	3.0	3.0	3.0	3.0	1.0	2.0	3.0	3.0	2.0
M-GEO-302.2	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0
M-GEO-302.3	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0
M-GEO-302.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0
Average	3.0	3.0	2.5	3.0	2.8	3.0	2.5	2.3	3.0	2.8	2.3

Mapping of Course Outcomes to Program Specific Outcomes

(Field Methods in Geography (Socio-economic)-Theory)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-302.1	2.0	2.0	2.0	3.0
M-GEO-302.2	2.0	3.0	3.0	3.0
M-GEO-302.3	3.0	3.0	3.0	3.0
M-GEO-302.4	2.0	3.0	3.0	3.0
Average	2.3	2.8	2.8	3.0

Semester-III
Elective Course Code: M-GEO-303 (i)
Elective Course Name: Urban Geography

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-303 (i).1: Provides understanding about evolution of towns and pattern of urbanization.

M-GEO-303 (i).2: Enrichment of knowledge about economic and functional characteristics of cities.

M-GEO-303 (i).3: Acquaintance with urban morphology and land use models.

M-GEO-303 (i).4: Familiarization with theories of urban development.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Urban geography: concepts, nature and scope.
2. Approaches to study urbanization and urban systems
3. Origin and evolution of towns and factors of urban growth; theories of urban origins
4. The global context of urbanization: trends and pattern; cycle of urbanization.

UNIT-II

5. Economic base of cities: concept and employment ratio.
6. Functional classification of cities: concepts and scheme of classification.
7. Rural Urban Fringe: structural characteristics and its development.
8. City and region: concepts of influence and dominance, methods of delimitation of area of influence and dominance.
9. SEZ: concept, policies and consequences.

UNIT-III

10. Urban morphology and land use structure: city core, commercial, industrial and residential areas.
11. Classical models of city structure: concentric zone model by E.W. Burgess, sector model by Homer Hoyt, multiple nuclei model by Harris and Ullman,
12. Modifications of the classical models: Kearsley's modifications of Burgess model, Mann's model of midsize British city, White's model of the 21st century city and Vance's urban realms model.
13. Internal structure of third world cities: Bazar model and colonial model of South Asian cities, model of South East Asian cities and model of African cities.

UNIT-IV

14. Social Area Analysis; Bases of residential segregation.
15. Diffusion theories by Bylund, Morrill, Hudson and Vance.
16. Rank size rule.
17. Law of primate city.

Suggested Readings:

1. Mayer, H.M. and Kohn, C.F. (1968) Readings in Urban Geography. The University of Chicago Press, Chicago.
2. Berry, J.E. (1970) Geography Perspective on Urban System, Prentice Hall, New Jersey.
3. Cater, Herald (1972) The study of Urban Geography, Edward Arnold, London.
4. Datta, A. and Shaban, A. (2017) Mega-Urbanization in Global South: Fast Cities and New Urban Utopias of the Post-colonial State, Routledge: London and New York.
5. Johnson, J. (1974) Suburban Growth, John Wiley and Sons, London.
6. Kaplan, Wheeler and Holloway (2007) Urban Geography, John Wiley, USA.
7. Clark, D. (1982), Urban Geography, Croom Helm, London and Cambridge.
8. Northern, R.M. (1979) Urban Geography, John Wiley, Toronto.
9. Michael P. (2004) Urban Geography: A Global Perspective, Routledge, USA.
10. Parnell, S. and Oldfield, S. (2014) The Routledge Handbook on Global Cities, Routledge, London.
11. Ramachandra, R. (1992) Urbanization and Urban System in India, Oxford, London.
12. Raymond and Murphy (1960) The American Cities: An Urban Geography, McGraw Hills, New York.
13. Scott, A.J. (2002) Global City-Regions: Trends, Theory, Policy, Oxford Press, London.
14. Southall, A. (1998) The City in Time and space, Cambridge University Press, Cambridge.

15. Sinha, S.P. (1984) Processes and Pattern of Urban Development in India: A Study of Haryana, The associated Publishers, Ambala Cantt.

Mapping of Course Outcomes to Program Outcomes (Urban Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-303 (i).1	3.0	1.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	1.0	2.0
M-GEO-303 (i).2	3.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	1.0	3.0
M-GEO-303 (i).3	3.0	3.0	3.0	3.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0
M-GEO-303 (i).4	3.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	1.0	2.0
Average	3.0	2.5	3.0	2.8	2.0	2.8	2.3	2.0	3.0	1.0	2.3

Mapping of Course Outcomes to Program Specific Outcomes (Urban Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-303 (i).1	3.0	1.0	2.0	3.0
M-GEO-303 (i).2	3.0	1.0	3.0	3.0
M-GEO-303 (i).3	3.0	1.0	2.0	3.0
M-GEO-303 (i).4	3.0	1.0	2.0	3.0
Average	3.0	1.0	2.3	3.0

Semester-III
Elective Course Code: M-GEO-303 (ii)
Elective Course Name: Geography of Wellbeing with Special Reference to India

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

- M-GEO-303 (ii).1:** Understanding the concept of social wellbeing in spatial context.
M-GEO-303 (ii).2: Enhancement of knowledge about human welfare issues and their identification.
M-GEO-303 (ii).3: Acquaintance with educational infrastructure and policies in India.
M-GEO-303 (ii).4: Enrichment of knowledge about spatial pattern of hunger, health and nutritional security.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Welfare geography: concept of social well-being, development and approaches to study human welfare.
2. Human beings: needs and wants, quality of life, level of living and state of well-being in India, identification of social indicators, their data sources and problem.

UNIT-II

3. Human Development Index, poverty and its measures, poverty and inequality in India
4. Gender issues in the process of development and gender development index.

UNIT-III

5. Structure of education in independent India, regional patterns of educational development; enrolment and dropouts with reference to school education.
6. Financing education and education policy in India.

UNIT-IV

7. Geography of health: concept of disease, ecology and epidemiology.
8. Health programmes and National Health Policy in independent India.
9. Nutritional security in India.

Suggested Readings:

1. Ahmad, A. (1999) Social Geography, Rawat Publication, New Delhi.
2. Coates, B.E., Johnston R.J. and Knox P.L. (1977) Geography and Inequality, Oxford University Press, London.
3. Jean, D. and Sen, A. (1996) Economic Development and Social Opportunity, Oxford University Press, New Delhi.
4. Jean, D. and Sen, A. (2002), India: Development and Participation, OUP, New Delhi.
5. Kapila, U. (2007) India's Economic Development Since 1947. Academic Foundation, New Delhi.
6. National Nutrition Monitoring Bureau (2000) Dynamic Database on Diet and Nutrition, National Institute of Nutrition, Hyderabad.
7. Sen, A. and Jean D. (1996) Indian Development: Selected Regional Perspectives, Oxford University Press.
8. Smith, D.M. (1977) Human Geography: A Welfare Approach, Arnold Heinemann.
9. Smith, D.M. (1973) The Geography of Social Well-being in the United States. McGrawHill, New York.
10. Smith, D.M. (1977) Where the Grass is Greener: Geographical Perspectives on Inequality, Penguin.

Mapping of Course Outcomes to Program Outcomes
(Geography of Wellbeing with Special Reference to India)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-303 (ii).1	3.0	2.0	2.0	3.0	2.0	2.0	1.0	3.0	3.0	2.0	1.0
M-GEO-303 (ii).2	3.0	3.0	3.0	3.0	2.0	3.0	1.0	3.0	3.0	2.0	1.0
M-GEO-303 (ii).3	3.0	3.0	2.0	3.0	1.0	2.0	2.0	3.0	3.0	2.0	1.0
M-GEO-303 (ii).4	3.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0
Average	3.0	2.8	2.3	3.0	1.8	2.5	1.5	2.8	3.0	2.0	1.3

Mapping of Course Outcomes to Program Specific Outcomes
(Geography of Wellbeing with Special Reference to India)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-303 (ii).1	3.0	2.0	2.0	1.0
M-GEO-303 (ii).2	3.0	2.0	3.0	2.0
M-GEO-303 (ii).3	3.0	3.0	2.0	2.0
M-GEO-303 (ii).4	3.0	3.0	3.0	3.0
Average	3.0	2.5	2.5	2.0

Elective Course Code: M-GEO-303 (iii)
Elective Course Name: Fluvial Geomorphology

Time: 3 Hours

Credits: 4

Total Marks : 100

External Assessment Marks : 70

Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-303 (iii).1: Acquaintance with the basic concepts of fluvial system.

M-GEO-303 (iii).2: Familiarization with sediment transfer processes and major types of channels.

M-GEO-303 (iii).3: Cognizance of flood forecasting and management techniques.

M-GEO-303 (iii).4: Awareness about flood plain management using geospatial technology.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Fluvial System: types, variables, feedbacks, thresholds, responses and scales in fluvial geomorphology.
2. Water erosion: types of water erosion and erosive processes, monitoring of water erosion (field measurements and models) management problems associated with erosion.

UNIT-II

3. Sediment transfer: sources, modes, storage, movement and measurement of sediment load and yield, controls as sediment yield, human activity and sediment yield.
4. Channel forms and processes: channel types, geometry, size, shape, channel pattern, bedrock channels and associated land forms.

UNIT-III

5. Floods: Flood frequency, magnitude, forecasting and structural and non-structural adjustment to floods, catastrophic and paleo floods.
6. Impact of construction activities on fluvial systems.
7. Human adjustment in floodplains.

UNIT-IV

8. Managing river channels: channelization and flow regulation; impacts of water management on the physical, chemical and ecological condition of channels and floodplains, river restoration.
9. Remote sensing and GIS applications in mapping, monitoring and management of fluvial environments.

Suggested Readings:

1. Charlton, R. 2008. Fundamentals of Fluvial Geomorphology, Routledge, London
2. Chorley R.J. 1973. Introduction of Fluvial Processes. Methuen and Company, London.
3. Fryirs, K.A. and Brierley G.J. 2013. Geomorphologic Analysis of River Systems, Wiley Blackwell, Chichester.
4. Gregory K.J. 1977. River Channel Changes. John Wiley and Sons, New York.
5. Gregory K.J. and Walling, D.E. 1985. Drainage Basin: Forms and Process-A Geomorphological Approach. John Wiley and Sons, New York.
6. Kingston D. 1984. Fluvial Forms and Processes. Edward Arnold, London.
7. Kondelf, G.M. and Piegay, H. 2003. Tools in Fluvial Geomorphology. Wiley, Chichester.
8. Leopold C.B. 1964. Fluvial Processes in Geomorphology. Freeman, London.
9. Morisawa. 1981. Fluvial Geomorphology. George Allen and Unwin, London.
10. Robert, A. 2003. River Processes-An Introduction to Fluvial Dynamics, Hodder Education.

Mapping of Course Outcomes to Program Outcomes (Fluvial Geomorphology)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-303 (iii).1	3.0	3.0	2.0	2.0	1.0	3.0	1.0	3.0	3.0	2.0	1.0
M-GEO-303 (iii).2	3.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	2.0
M-GEO-303 (iii).3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0
M-GEO-303 (iii).4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
Average	3.0	3.0	2.5	2.8	2.3	3.0	2.3	3.0	3.0	1.8	2.3

Mapping of Course Outcomes to Program Specific Outcomes (Fluvial Geomorphology)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-303 (iii).1	3.0	2.0	1.0	3.0
M-GEO-303 (iii).2	3.0	3.0	2.0	3.0
M-GEO-303 (iii).3	3.0	3.0	3.0	3.0
M-GEO-303 (iii).4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.3	3.0

Semester-III
Elective Course Code: M-GEO-303 (iv)
Elective Course Name: Climate Change and Earth Systems

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

- M-GEO-303 (iv).1:** Understanding about dynamics, trend and pattern of past climates.
M-GEO-303 (iv).2: Enrichment of knowledge about role of GHGs in global warming.
M-GEO-303 (iv).3: Acquaintance with future trends of climate change and policy framework.
M-GEO-303 (iv).4: Awareness about impacts of global warming on earth systems and environment.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Climatic variations, fluctuations and change.
2. Past climates and evidences of climate change.
3. Terrestrial and extra-terrestrial hypotheses of Climate Change

UNIT-II

4. Earth's radiation balance, Greenhouse effect and global warming.
5. Greenhouse gases: emission, concentration and effects.
6. Biochemical cycle of carbon and other Greenhouse gases.

UNIT-III

7. IPCC and its reports: trend and pattern of global warming.
8. Future climate change and predictions.
9. World climate policy framework: Rio Summit, Kyoto Protocol and Paris Agreement.

UNIT-IV

10. Climate change impacts on sea level and oceanic environment.
11. Climate change, water resources and agriculture.
12. Global warming, disaster vulnerability and environment.

Suggested Readings:

1. Andrew Dessler, 2011. Introduction to Modern Climate Change, Cambridge University Press.
2. Andrew Dessler, 2012. The Science and Politics of Global Climate Change, Cambridge University Press.
3. Anthony Giddens, 2013. The Politics of Climate Change, Wiley.
4. David Wallace-Wells, 2019. The Uninhabitable Earth, Penguin Books.
5. John Houghton, 2009. Global Warming: The Complete Briefing, Cambridge University Press.
6. Jefferey Bennet, 2016. Global Warming Primer, <https://www.globalwarmingprimer.com/>.
7. Intergovernmental Panel on Climate Change, UNEP and WMO. IPCC Assessment Reports 1-5.
8. Trewartha G. T., 1980. An Introduction to Climate, McGraw Hill Company, New York.
9. Will Steffen, Regina Angelina Sanderson, Peter D. Tyson, Jill Jagger, Pamela A. Matson, Berrien Moore III, Frank Oldfield, Katherine Richardson, Hans-Joachim Schellenberg, Billie L. Turner and Robert J. Wasson, 2005. Global Climate Change and the Earth System: A Planet under Pressure. Springer Verlag Berlin Heidelberg, Germany.

Mapping of Course Outcomes to Program Outcomes (Climate Change and Earth Systems)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-303 (iv).1	3.0	3.0	2.0	1.0	1.0	2.0	2.0	3.0	3.0	3.0	1.0
M-GEO-303 (iv).2	3.0	3.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0
M-GEO-303 (iv).3	3.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0
M-GEO-303 (iv).4	3.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.8	2.3	2.3	1.8	2.3	2.8	3.0	3.0	2.3	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Climate Change and Earth Systems)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-303 (iv).1	3.0	2.0	3.0	2.0
M-GEO-303 (iv).2	3.0	2.0	3.0	3.0
M-GEO-303 (iv).3	3.0	3.0	3.0	2.0
M-GEO-303 (iv).4	3.0	2.0	3.0	2.0
Average	3.0	2.3	3.0	2.3

Elective Course Code: M-GEO-303 (v)
Elective Course Name: Resource Geography

Time: 3 Hours
Credits: 4

Total Marks	: 100
External Assessment Marks	: 70
Internal Assessment Marks	: 30

Course Outcomes (COs):

M-GEO-403 (ii).1: Basic understanding about concept of resource, environment and development.

M-GEO-403 (ii).2: Enrichment of knowledge about resource availability, accessibility and distribution.

M-GEO-403 (ii).3: Acquaintance with concepts of resource use, core-periphery relations and imbalanced development.

M-GEO-403(ii).4: Awareness about management techniques of resources for sustainable development.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

Concept and Scope of Resource Geography; Resource and ecosystem services: concept and types in relation to related concepts- environment, ecosystem, nature as nurture; World resources: classification of resources- changing profile and concerns; understanding relationship between natural resources and development process, and livelihoods with special reference to poor in the developing world. Sustainable development and some concerns from the past- from dooms day, zero growth to Rio and subsequent Earth summits.

UNIT-II

Natural resource-based development processes in history: the agricultural transition, the era of Malthusian stagnation, Emergence of world economy, rise of the Western Europe with special reference to golden era of resource-based development (1870-1913), colonial origins and resource exploitation, center-periphery trade-resource dependency and unequal development.

UNIT-III

Models of Natural Resources Process: Zimmermann's Primitive and Advance Models of natural resource process- population, resources and carrying capacity, Kirk's Decision Model, Brookfield System Model; The resource curse hypothesis; open access exploitation hypothesis; factor endowment hypothesis; resources and common property/ entitlement-opportunity hypothesis; Resource exploitation and internal colonization, accumulation by dispossession; poverty and resource degradation.

UNIT-IV

Management of Natural Resources: Meaning and Concept of conservation of Natural Resources, Resources and governance- State, civil society and state- resource tenure and property rights-access and ownership; decentralization, participation and Justice- fundamentals of community based natural resources management (C-BNRM); political economy and C-BNRM; reconciling biodiversity with development. Conservation and Management Methods of Natural resources: Soil Resource, Water Resource, Forest Resource and Mineral Resources, Problems of Natural Resource Management in India. Policies for sustainable resource-based development.

Suggested Readings:

1. Barbier, Edward B (2005) Natural Resources and Economic Development, Cambridge University Press.
2. Borton, I and R W Kates (1984) Readings in Resource Management and Conservation, University of Chicago Press, Chicago.
3. Bruce, Mitchell (1989) Geography and Resource Analysis, John Wiley and Son, New York.
4. Eliot Hurst, M E (1972) A Geography of Economic Behavior: An Introduction, Duxbury Press, California.
5. Fabricius, C and Eddie Koch (2004) Rights, Resources and Rural Development: Community based Natural Resource Management in Southern Africa, Earthscan, London.
6. Guha, J L and P R Chattopj (1994) Economic Geography-A Study of Resources, The World Press Pvt. Ltd. Calcutta.
7. Martino, R L (1969) Resource Management. McGraw Hill Book Co., London.
8. Negi, B S (2000) Geography of Resources, Kedar Nath and Ram Nath, Meerut.
9. Owen, Oliver (1971) Natural Resource Conservation: An Ecological Approach, McMillan, New Delhi.
10. Raja, M (1989) Renewable Resources, Development, Concept Publication, New Delhi.
11. UNDP & World Resource Institute (2005) The Wealth of the Poor-Managing Ecosystems to Fight Poverty, World Resources Institute, Washington, DC.
12. Zimmermann, E. W. (1951) World Resources and Industries, Harper and Brothers, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Resource Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-403 (ii).1	3.0	1.0	3.0	2.0	2.0	1.0	1.0	2.0	3.0	1.0	2.0
M-GEO-403 (ii).2	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-403 (ii).3	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	1.0	2.0
M-GEO-403 (ii).4	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	1.0	2.0
Average	3.0	2.3	3.0	2.8	2.0	2.3	2.3	2.5	3.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Resource Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-403 (ii).1	3.0	1.0	1.0	2.0
M-GEO-403 (ii).2	3.0	1.0	2.0	3.0
M-GEO-403 (ii).3	3.0	1.0	3.0	3.0
M-GEO-403 (ii).4	3.0	1.0	3.0	3.0
Average	3.0	1.0	2.3	2.8

Semester-III
Elective Course Code: M-GEO-304 (i)
Elective Course Name: Political Geography

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-304 (i).1: Familiarization with the conceptual framework of geo-political issues.

M-GEO-304 (i).2: Augmentation of knowledge about state and nation in geographic perspective.

M-GEO-304 (i).3: Enhancement of knowledge about global strategic views and geo-politics in post-cold war era.

M-GEO-304 (i).4: Awareness about contemporary geo-political situation and issues in India.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Nature and scope of political geography, its approaches and recent trends.
2. School of thoughts: political economy, world system, globalization.

UNIT-II

3. Concept of nation, state and nation-state, nationalism and nation building, emergence and growth of territorial state, globalization and the crisis of the territorial state forms of governance: unitary and federal.
4. Distinction between frontiers and boundaries, demarcation of boundaries, classification and functions of boundaries.
5. Landlocked state: advantages and disadvantages.

UNIT-III

6. Global strategic views: Mahan and Sea power; Mackinder and Heartland; Spykman and Rimland Servasky and Air power.
7. Geo-politics in the post-cold war world- S.B. Cohen's model of geo-politics.

UNIT-IV

8. Emergence of India as regional power: geo-political significance of Indian and Pacific Ocean.
9. Geo-political issues in India with special reference to water disputes and riparian claims.
10. Gerrymandering and electoral abuse in India.
11. Kashmir problem and Indo-Pak relations.

Suggested Readings:

1. Alexander, L.M. World Political Patterns Ran Mc Nally, Chicago, 1963.
2. De Blij, H.J. and Glassner, Martin. Systematic Political Geography, John Wiley, New York, 1968.
3. Deshpande C.D: India-A Regional Interpretation Northern Book Centre, New Delhi, 1992.
4. Dikshit, R. D. Political Geography: A Contemporary perspective, Tata McGraw Hill, New Delhi, 1996.
5. Dikshit, R.D. Political geography: A Century of Progress, Sage, New Delhi, 1999.
6. Fisher Charles A. Essays in Political Geography, Methuen, London, 1968.
7. John R. Short. An Introduction to Political Geography, Routledge, London, 1982.
8. Moddie, A.E. Geography Behind Political Hutchinson, London, Latest edition.
9. Pounds N.J.G. Political Geography. McGraw Hill, New York, 1972.
10. Prescott. J.R.V. The Geography of Frontiers and Boundaries Aldine, Chicago.
11. Sukhwai, B.L. Modern Political Geography of India Sterling Publishers, New Delhi. 1968.
12. Taylor, P. Political Geography, Longman, London. 1985.

Mapping of Course Outcomes to Program Outcomes (Political Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-304 (i).1	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	3.0	1.0	2.0
M-GEO-304 (i).2	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-304 (i).3	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-304 (i).4	3.0	3.0	3.0	3.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0
Average	3.0	2.8	2.8	2.5	2.0	2.3	2.0	2.3	3.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Political Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-304 (i).1	3.0	1.0	1.0	2.0
M-GEO-304 (i).2	3.0	1.0	2.0	2.0
M-GEO-304 (i).3	3.0	1.0	2.0	3.0
M-GEO-304 (i).4	3.0	1.0	2.0	3.0
Average	3.0	1.0	1.8	2.5

Semester-III
Elective Course Code: M-GEO-304 (ii)
Elective Course Name: Geography of Rural Settlements

Time: 3 Hours
Credits: 4

Total Marks	: 100
External Assessment Marks	: 70
Internal Assessment Marks	: 30

Course Outcomes (COs):

- M-GEO-304 (ii).1:** Understanding about the fundamental concepts of settlement geography.
M-GEO-304 (ii).2: Enhancement of knowledge about types and patterns of rural settlements
M-GEO-304 (ii).3: Acquaintance with various social issues in rural settlements.
M-GEO-304 (ii).4: Knowledge about environmental issues and rural development planning in India.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Nature, scope, significance and development of settlement geography. Approaches in rural settlement geography.
2. Histogenesis of rural settlements: historical development, definition and characteristics of rural settlement, distribution of rural settlements, size and spacing of rural settlements in India.

UNIT-II

3. Rural Settlement: types, forms and patterns.
4. Regionalization of rural settlements with special reference to India.

UNIT-III

5. Social issues in rural settlements: Poverty, housing, health care and inequality in India.
6. Cultural landscape elements in rural settlements: House type and field pattern.

UNIT-IV

7. Environmental issues in rural settlements.
8. Rural development planning in India.

Suggested Readings:

1. Alam, S.M. Settlement System of India, Oxford and IBH Publication Co, New Delhi, 1982.
2. Brock, J.O.M and Welb, J.W. Geography of Mankind. McGraw Hill, London, 1978.
3. Chisholm, M. Rural settlements and Land Use, John Wiley, New York, 1967.
4. Clout, H.D. Rural Geography, Pergamon, Oxford, 1977.
5. Daniel, P. and Hopkinson, M. The Geography of Settlement. Oliver & Boyd, Edinburgh, 1986.
6. Grover, N. Rural Settlements – A Cultural Geographical analysis, Inter-India Publication, Delhi, 1985.
7. Hudson, R.S. A Geography of Settlements, MacDonald & Evans., New York, 1976.
8. Mitra, A. Report on House Types and Village settlement Patterns in India. Publication Development, Govt. Of India, New Delhi, 1960.
9. Mayer, I and R.J. Haqqet. Settlements: Theory and Practice. Harper & Row, London, 1979.
10. Ramachandran, H. Village Clusters and Rural Development, Concept Publication, New Delhi, 1985.
11. Rao, E.N. Strategy for Integrated Rural Development, B.R. Publication Cor., Delhi, 1986.
12. Rappaport, A. House form and Culture, Prentice Hall, New Jersey, 1969.
13. Sen, L.K. Readings in Micro-level Planning and Rural Growth Centres. National Institute of Community Development, Hyderabad, 1972.
14. Singh, R.L. Transformation of Rural Habitat in Indian Perspectives: A Geographic Dimension, NGSI Research Publication, No. 19, Varanasi, 1978.
15. Srinivas, M.N. Village India, Asia Publication House, Bombay, 1968.
16. Wan Mali, S.: Service Centres in Rural India, B.R. Publication, New Delhi, 1983.

Mapping of Course Outcomes to Program Outcomes (Geography of Rural Settlements)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-304 (ii).1	3.0	1.0	3.0	3.0	2.0	2.0	1.0	2.0	3.0	1.0	2.0
M-GEO-304 (ii).2	3.0	3.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	1.0	2.0
M-GEO-304 (ii).3	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
M-GEO-304 (ii).4	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0
Average	3.0	2.0	2.5	2.5	2.0	2.0	2.0	2.0	3.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Geography of Rural Settlements)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-304 (ii).1	3.0	1.0	1.0	2.0
M-GEO-304 (ii).2	3.0	1.0	3.0	3.0
M-GEO-304 (ii).3	3.0	1.0	2.0	2.0
M-GEO-304 (ii).4	3.0	1.0	2.0	2.0
Average	3.0	1.0	2.0	2.3

Semester-III
Elective Course Code: M-GEO-304 (iii)
Elective Course Name: Soil Geography

Time: 3 Hours

Credits: 4

Total Marks : 100

External Assessment Marks : 70

Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-304 (iii).1: Acquaintance with soil profile and soil forming processes.

M-GEO-304 (iii).2: Enrichment of knowledge about physical, chemical and biological properties of soils.

M-GEO-304 (iii).3: Awareness about soil erosion and degradation processes.

M-GEO-304 (iii).4: Augmentation of knowledge about soil conservation and soil survey methods.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Nature and scope of soil geography.
2. Soil formation factors (parent material, flora and fauna, climatic and topographic) and processes of soil formation and soil development (physical, biotic and chemical).
3. Soil profile and its characteristics (zonal, azonal and intra zonal soils).

UNIT-II

4. Physical properties of soils: morphology, (texture, structure, colour, porosity and permeability), water, air and temperature.
5. Chemical properties of soils: soils reaction and controlling factors, soil clays, organic matter and humus.
6. Biological properties of soils (soil organisms).

UNIT-III

7. Soil classification: genetic, taxonomic and 7th Approximation, their characteristics and world patterns.
8. Soil erosion and degradation processes

UNIT-IV

9. Conservation methods to improve the physical qualities of soils.
10. Methods and mechanism of soil survey.
11. Soil reclamation and management, integrated soil and management.

Suggested Readings:

1. Birkland P.W. 1999. Soil and Geomorphology, oxford university press, Inc., New York.
2. Brady NC and Weil Raymond C.2012. The nature and Properties of soils, Pearson publishing, New Delhi.
3. Brickland, PW. 1984. Soils and Geomorphology. Oxford University Press, London.
4. Buckman, H.O and Brady, N.C. 1960. The Nature and Properties of Soils. MacMillan, New York.
5. Bunting, B.T. 1973. The Geography of Soils, Hutchinson, London.
6. Clark, GR. 1957. Study of Soil in the Field, Oxford University Press, Oxford.
7. Daji, JA.1970. A Text Book of Soil Science. Asia Publishing House, New Delhi.
8. Foth H.D. and Turk LM. 1972. Fundamentals of Soil Science. John Wiley, New York.
9. Mc. Bride, M.B. 1999. Environmental Chemistry of Soils, Oxford University Press, New York.
10. Pitty, A.F. 1978. Geography and Soil Properties. University Press, London.
11. Ray Choudhuri, S.P. 1958. Soils of India, ICAR, New Delhi.
12. Sehgal, J.2000. Pedology-concepts and Applications. Kalyani Publications, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Soil Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-304 (iii).1	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	3.0
M-GEO-304 (iii).2	3.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	1.0	3.0
M-GEO-304 (iii).3	3.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0
M-GEO-304 (iii).4	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
Average	3.0	2.8	2.0	2.8	2.5	3.0	2.0	2.8	3.0	1.5	3.0

Mapping of Course Outcomes to Program Specific Outcomes (Soil Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-304 (iii).1	3.0	2.0	3.0	3.0
M-GEO-304 (iii).2	3.0	2.0	3.0	3.0
M-GEO-304 (iii).3	3.0	3.0	3.0	3.0
M-GEO-304 (iii).4	3.0	3.0	3.0	3.0
Average	3.0	2.5	3.0	3.0

Semester-III
Elective Course Code: M-GEO-304 (iv)
Elective Course Name: Geography and Disaster Management

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

- M-GEO-304 (iv).1:** Understanding about the spatial dimensions and distribution of disasters
M-GEO-304 (iv).2: Enrichment of knowledge about natural and human induced disasters.
M-GEO-304 (iv).3: Acquaintance with the concepts of disaster management, vulnerability and mitigation
M-GEO-304 (iv).4: Awareness about the role of geospatial technology in disaster management.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Disasters and hazards: definition, nature and classification.
2. Geography and disasters: major disasters of world, disaster profile of India.
3. Tectonic disasters: volcanoes, earthquakes, tsunamis, landslides.

UNIT-II

4. Hydrological disasters: floods and droughts.
5. Climatic disasters: cyclones and heavy precipitation events.
6. Human induced disasters: epidemics, industrial and transport disasters; wars and terrorism induced disasters.

UNIT-III

7. Disaster management in India: policy and organizational structure setup.
8. Disaster vulnerability and affecting factors.
9. Planning for disaster mitigation measures and preparedness.

UNIT-IV

10. Post disaster recovery and rehabilitation.
11. Impacts of disaster on society and economy.
12. Geospatial technology applications in disaster prevention and monitoring.

Suggested Readings:

1. Nlaikie, P(1994) At Risk: Natural Hazards, People's Vulnerability and Disasters, Routledge, London.
2. Carter, NW (1991) Disaster Management: A Disaster Manager's Handbook, ADB, Manila.
3. Cuny, FC (1983) Disasters and Development, Oxford University Press.
4. Hewitt, K (1977) Regions of Risk: A Geographical Introduction to Disasters, Longman, Harlow.
5. National Policy on Disaster Management (2009) Ministry of Home Affairs, Govt. of India, New Delhi.
6. Smith, K (1996) Environmental Hazards: Assessing Risks and Reducing Disasters, Routledge, London.
7. Varley, A. Disaster, Development and Environment, John Wiley and Sons, Chichester.

Mapping of Course Outcomes to Program Outcomes (Geography and Disaster Management)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-304 (iv).1	3.0	2.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	1.0	2.0
M-GEO-304 (iv).2	3.0	2.0	3.0	2.0	1.0	3.0	1.0	2.0	3.0	1.0	2.0
M-GEO-304 (iv).3	3.0	3.0	3.0	3.0	1.0	3.0	1.0	3.0	3.0	2.0	3.0
M-GEO-304 (iv).4	3.0	3.0	3.0	3.0	1.0	3.0	3.0	3.0	3.0	2.0	3.0
Average	3.0	2.5	3.0	2.5	1.0	2.8	1.5	2.5	3.0	1.5	2.5

Mapping of Course Outcomes to Program Specific Outcomes (Geography and Disaster Management)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-304 (iv).1	3.0	2.0	1.0	3.0
M-GEO-304 (iv).2	3.0	3.0	2.0	3.0
M-GEO-304 (iv).3	3.0	3.0	2.0	3.0
M-GEO-304 (iv).4	3.0	3.0	2.0	3.0
Average	3.0	2.8	1.8	3.0

Semester-III
Elective Course Code: M-GEO-304 (v)
Elective Course Name: Biogeography

Time: 3 Hours

Credits: 4

Total Marks : 100

External Assessment Marks : 70

Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-304 (v).1: Understanding about basic ecological principles.

M-GEO-304 (v).2: Enrichment of understanding about distribution of plants and animals' life on the earth.

M-GEO-304 (v).3: Awareness about conservation of biotic resources and effects of industrial effluents on ecosystems.

M-GEO-304 (v).4: Acquaintance with environmental hazards and enactment of forest and wild life policy in India.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Nature, scope and significance of biogeography.
2. Basic ecological principles: Bio-energy cycle in territorial ecosystem; energy budget of the earth; trophic levels and food web.
3. Origin of fauna and flora: major gene centers; domestication of plants and animals and their disposal agents and roots.

UNIT-II

4. Distribution of plant life on the earth and its relation to soil, climate and human activities.
5. Geographical distribution of animal life on the earth and its relation to vegetation types, climate and human activities.

UNIT-III

6. Communities: nature of communities and ecosystems: bio-diversities; human induced communities change; habitat decay and conservation of biotic resources.
7. Industrial effluent and its effect on fresh water and marine biology.

UNIT-IV

8. Environmental hazards: Ecological consequences, human perception and adjustment with respect to flood, drought and earthquake.
9. Bio-Reserves in India.
10. National forest and wild life policy of India.

Suggested Readings:

1. Cox, C.D. and Moore, P.D.: Biogeography: An Ecological and Evolutionary Approach, Blackwell, 1993.
2. Huggett, R.J.: Fundamentals of Biogeography. Routledge, U.S.A. 1998.
3. Lillies, J.: Introduction of Zoogeography, McMillan. London. 1974.
4. Khushoo, T.N. and Sharma, M.: Indian Geosphere-Biosphere Har-Anand Publication, Delhi 1991.
5. Mathur, H.S.: Essentials of Biogeography, Anuj Printers, Jaipur, 1998.
6. Pears, N.: Basic Biogeography, Longman, London, 1985.
7. Simmon, I.G.: Biogeography, Natural and Cultural, Longman, London 1974.
8. Tivy, J.: Biogeography: A study of Plants in Ecosphere, Oliver and Boyd, U.S.A., 1992.

Mapping of Course Outcomes to Program Outcomes (Biogeography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-304 (v).1	3.0	1.0	2.0	2.0	2.0	1.0	1.0	2.0	3.0	1.0	2.0
M-GEO-304 (v).2	3.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	3.0	1.0	2.0
M-GEO-304 (v).3	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	1.0	3.0
M-GEO-304 (v).4	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	1.0	3.0
Average	3.0	2.3	2.5	2.5	2.0	2.3	2.0	2.5	3.0	1.0	2.5

Mapping of Course Outcomes to Program Specific Outcomes (Biogeography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-304 (v).1	3.0	1.0	1.0	2.0
M-GEO-304 (v).2	3.0	1.0	1.0	2.0
M-GEO-304 (v).3	3.0	1.0	2.0	3.0
M-GEO-304 (v).4	3.0	1.0	1.0	3.0
Average	3.0	1.0	1.3	2.5

Semester-III
Core Course Code: M-GEO-305
Core Course Name: Introduction to Remote Sensing (Theory)

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 35
Internal Assessment Marks : 15

Course Outcomes (COs):

- M-GEO-305.1:** Acquaintance with fundamentals of remote sensing.
M-GEO-305.2: Development of capability to interpret the aerial photographs.
M-GEO-305.3: Enrichment of skills to extract information from resource satellite imageries.
M-GEO-305.4: Awareness about digital image processing and its applications in resource monitoring and mapping.

Note for Paper Setters: Question 1 is compulsory comprising of four sub parts (two marks for each sub part), to be answered in 25-30 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. Question 1 carries eight marks. Long questions carry nine marks each.

UNIT-I

1. Aerial Photographs: History, definition and advantages and limitations. Types of aerial photographs and resolution. Mirror Stereoscope, stereoscopic parallax, relief displacement. Elements of aerial photo interpretation.
2. Remote Sensing, definition and scope, EMR and spectrum. Blackbody Radiation and Kirchhoff's Law. Interaction of EMR with atmosphere and earth surface features. Atmospheric window. Remote Sensing Platforms and Sensors. Orbits, Resolution and types of remote sensing.

UNIT-II

3. Concept of Multispectral, Thermal and Hyper spectral remote sensing. Major earth resource Satellites: LANDSAT, SPOT and IKONOS. Indian Space Program and characteristics of Indian remote sensing satellite and data.
4. Digital Image processing and application: image restoration and correction. Image classification: supervised and unsupervised. Applications in resource mapping and monitoring.

Suggested Readings:

1. Avery T.E., and G.L. Berlin (1992): Fundamentals of Remote Sensing and Air Photo Interpretation, Macmillan, New York, USA.
2. Aggarwal C.S. and P.K. Garg (2000). Remote Sensing, A.H. Wheeler & Co. Ltd, New Delhi.
3. Campbell, J.B. (2002) Introduction to Remote Sensing, Taylor & Francis, New York, USA.
4. Jensen, J.R. (2000), Remote Sensing of the Environment: An Earth Resource Perspectives, Pearson Education.
5. Lillesand, T.M. and Keffer R. (1994) Remote Sensing and Image Interpretation, John Wiley & Sons, New York.
6. Meenakshi Kumar (2000), Text book on Remote Sensing; NCERT, New Delhi.
7. Nag and Kudrat (2002), Remote Sensing and Image Interpretation, Concept Publishers, Delhi.
8. Reddy, A. (2000) Remote Sensing and Geographical Information System (An Introduction), Hyderabad.

Mapping of Course Outcomes to Program Outcomes (Introduction to Remote Sensing-Theory)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-305.1	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
M-GEO-305.2	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	1.0
M-GEO-305.3	3.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0
M-GEO-305.4	3.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	1.0
Average	3.0	2.5	2.5	2.5	2.3	3.0	3.0	3.0	3.0	2.0	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Introduction to Remote Sensing-Theory)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-305.1	2.0	3.0	3.0	3.0
M-GEO-305.2	2.0	3.0	3.0	3.0
M-GEO-305.3	3.0	3.0	3.0	3.0
M-GEO-305.4	3.0	3.0	3.0	3.0
Average	2.5	3.0	3.0	3.0

Semester-III
Core Course Code: M-GEO-306
Core Course Name: Introduction to Remote Sensing (Practical)

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

- M-GEO-306.1:** Acquisition of skills of measurements on aerial photographs.
M-GEO-306.2: Capability of reading and interpreting physical and socio-economic features on photographs.
M-GEO-306.3: Acquaintance with different digital data products and software for the processing of satellite data.
M-GEO-306.4: Enhancement of skills about processing and extracting features from satellite imageries.

Note for Paper Setters: The examiner shall set four questions, two from each unit. The candidate shall attempt three questions in all, selecting at least one question from each unit.

Distribution of Marks for Evaluation

Exercise	= 45	File Record	= 10	Viva-voce	= 15
UNIT-I					
1. Basic information on aerial photographs (annotation and markings).					
2. Identification of Fiducial marks, Principal point, Conjugate Principal points and Flight line.				1 exercise	
3. Calculation of scale of aerial photographs.				2 exercise	
4. Determination of height of objects on single vertical aerial photographs.				1 exercise	
5. Stereoscope vision and identification of objects on ZEISS card.				1 exercise	
6. Interpretation and preparation of land use/land cover from aerial photographs				2 exercise	
7. Preparation of interpretation key of satellite imageries				1 exercise.	
8. Visual interpretation and preparation of land use/land cover from satellite imageries				1 exercise	
UNIT-II					
9. Georeferencing of Satellite Data by georeferenced toposheet or GCP's				1 exercise	
10. Pre-processing of imageries (i) image enhancement (ii) sub set and (iii) resolution merge/sharpening of image				3 exercise	
11. Preparation of FCC and comparison of features on true colour, panchromatic and FCC				3 exercise	
12. Digital classification of satellite data (supervised and unsupervised)				2 exercise	

Suggested Readings:

1. Bhatta Basudeb (2014). Remote Sensing and GIS. Oxford University Press, Oxford.
2. Guha Pardeep (2013). Remote Sensing for the Beginner. East West Press, New Delhi.
3. Kumar Meenakshi 2001. Remote Sensing, NCERT, New Delhi.
4. Lillesand and R.W. Kiefer, 2005. Remote Sensing and Image Interpretation, John Wiley and Sons.
5. Pritvish Nag, and M. Kudrat 1998. Digital Remote Sensing, Concept Publishing Company, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Introduction to Remote Sensing-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-306.1	3.0	3.0	2.0	3.0	1.0	2.0	3.0	3.0	3.0	2.0	1.0
M-GEO-306.2	3.0	3.0	3.0	3.0	1.0	2.0	3.0	3.0	3.0	1.0	2.0
M-GEO-306.3	3.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0
M-GEO-306.4	3.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	3.0	2.5	2.8	1.5	2.3	3.0	3.0	3.0	1.8	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Introduction to Remote Sensing-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-306.1	2.0	3.0	3.0	2.0
M-GEO-306.2	3.0	3.0	3.0	2.0
M-GEO-306.3	2.0	3.0	3.0	3.0
M-GEO-306.4	2.0	3.0	3.0	3.0
Average	2.3	3.0	3.0	2.5

Semester-III
Core Course Code: M-GEO-307
Core Course Name: Project Report Based on Field Survey

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-307.1: Ability to work as a team and handle the field situations.

M-GEO-307.2: Gives opportunity to identify socio-economic problem and formulation of research design.

M-GEO-307.3: Awareness about sampling techniques for data collection in the field.

M-GEO-307.4: Training of retrieval, analysis and interpretation of socio-economic field data.

Note for Paper Setters: Examiner will have to evaluate the candidate on the basis of field report prepared by the student.

Distribution of Marks for Evaluation of Project Report

Field Report: 40 marks

Viva-voce on report: 30 marks

Suggested Readings:

1. Black James A and D.J. Champion (1976): Methods and Issues in Social Research, New York, John Wiley and Sons, Inc.
2. Goode and Hat, Research Methodology in Social Sciences, Oxford University Press, New Delhi.
3. Gomez B and John Paul Jones. 2010. Research Methods in Geography-A Critical Introduction. Wiley Blackwell Publications, Singapore.
4. Har Prasad (1992) Research Methods and Techniques in Geography, Rawat Publishers, Jaipur.
5. Kundu A. Measurement of Urban Processes: A Study of Regionalization, Popular Prakashan, Mumbai.
6. Mishra, H.N. and Singh V.P.(1998) Research Methodology: Social, Spatial and Policy Dimensions, Rawat Publishers, Jaipur.

Mapping of Course Outcomes to Program Outcomes (Project Report Based on Field Survey)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-307.1	1.0	2.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	2.0	3.0
M-GEO-307.2	3.0	3.0	2.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0	2.0
M-GEO-307.3	3.0	3.0	1.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	2.0
M-GEO-307.4	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	3.0
Average	2.5	2.8	2.0	2.5	2.3	2.5	2.0	3.0	3.0	2.3	2.5

Mapping of Course Outcomes to Program Specific Outcomes (Project Report Based on Field Survey)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-307.1	1.0	2.0	3.0	3.0
M-GEO-307.2	2.0	2.0	3.0	3.0
M-GEO-307.3	2.0	3.0	3.0	3.0
M-GEO-307.4	3.0	3.0	3.0	3.0
Average	2.0	2.5	3.0	3.0

Semester-III
Open Elective Course Code: M-GEO-OE-304
Open Elective Course Name: General Geography of World

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 35
Internal Assessment Marks : 15

Course Outcomes (COs):

M-GEO-OE-304.1: Understanding about the geographical expansion of continents and oceans.

M-GEO-OE-304.2: Acquaintance with the geophysical structure of world.

M-GEO-OE-304.3: Enrichment of knowledge about ethnic and religious composition of population.

M-GEO-OE-304.4: Capability to understand the population characteristics and economies of the world.

Note for Paper Setters: Question 1 is compulsory comprising of four sub parts (two marks for each sub part), to be answered in 25-30 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. Question 1 carries eight marks. Long questions carry nine marks each.

UNIT-I

1. Continents and oceans: their location, expansion and geographical characteristics.
2. World major physiographic units: mountain, plains and plateaus.
3. World climates and major climatic regions.
4. Major soil types and natural vegetation.

UNIT-II

5. Human biological diversity, ethnicity and distribution of races.
6. Major religions of world and their distribution.
7. Population: distribution, density and growth.
8. World economy: characteristics of developed and developing economies.

Suggested Readings:

1. Hussain, Majid (2006) World Geography, Rawat Publishers, New Delhi.
2. McDougal, Holt (2010) World Geography, HMH Publishing Co.
3. Pounds and Taylor (1974) World Geography, South Western Publishing Co., Ohio.

Mapping of Course Outcomes to Program Outcomes (General Geography of World)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-OE-304.1	3.0	1.0	1.0	2.0	1.0	2.0	1.0	2.0	3.0	3.0	1.0
M-GEO-OE-304.2	3.0	2.0	1.0	1.0	2.0	1.0	1.0	3.0	3.0	2.0	1.0
M-GEO-OE-304.3	3.0	2.0	1.0	1.0	1.0	2.0	1.0	2.0	2.0	2.0	1.0
M-GEO-OE-304.4	3.0	2.0	2.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	1.0
Average	3.0	1.8	1.3	1.5	1.5	1.5	1.0	2.3	2.8	2.3	1.0

Mapping of Course Outcomes to Program Specific Outcomes (General Geography of World)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-OE-304.1	3.0	2.0	1.0	2.0
M-GEO-OE-304.2	3.0	2.0	2.0	2.0
M-GEO-OE-304.3	3.0	1.0	2.0	2.0
M-GEO-OE-304.4	3.0	2.0	2.0	2.0
Average	3.0	1.8	1.8	2.0

Semester-IV
Core Course Code: M-GEO-401
Core Course Name: Geographical Thought

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

- M-GEO-401.1:** Cognizance of nature and philosophy of geography.
M-GEO-401.2: Contextualization of development of geographic knowledge in ancient and medieval period.
M-GEO-401.3: Awareness about philosophy and concepts of modern geography.
M-GEO-401.4: Acquaintance with positivist and alternative explanations in geography.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Classification of knowledge, nature of geography and its place among sciences.
2. Nature of geographic knowledge during ancient (Greek and Roman) and medieval (Arab) periods
3. Foundation of modern geography-contributions of Varenus, Kant, Humboldt and Ritter.

UNIT-II

4. Emergence of geography as a study of (i) physical features (ii) chorology (iii) landscapes.
5. Concepts in geography: environmental determinism and possibilism, areal differentiation.
6. Dichotomy and dualism in Geography: Physical vs Human Geography and Systematic vs Regional Geography.

UNIT-III

7. Quantitative revolution-emergence of geography as spatial science.
8. Positivist explanations in geography- laws, theories, models.
9. Inductive and deductive logic in geographic explanations.

UNIT-IV

10. Behavioral and humanistic perspectives in geography.
11. Social relevance in geography-Welfare, Radical and Feminist Perspectives.
12. Postmodernism and Geography.

Suggested Readings:

1. Creswell Tim (2013), Geographic Thought: A critical introduction, Wiley- Blackwell.
2. Dickinson, R E (1969), The Makers of Modern Geography, London.
3. Dikshit, RD (1997), Geographical Thought-A Contextual History of Ideas, Prentice Hall of India, New Delhi.
4. Gaile GL and Willmott CJ (2003), Geography in America at the Dawn of 21st Century, Oxford.
5. Hartshorne, R (1959), Perspectives on the Nature of Geography, Rand MacNelly, Chicago.
6. Harvey David (1989), Explanation in Geography, Edward Arnold, London.
7. Holt-Jonson (2011), Geography, History and Concepts: A Study's Guide, Sage Publications.
8. James PE and Martin J Geoffrey (1972), All possible Worlds, John Wiley and Sons, New York.
9. Johnston, RJ (1983), Geography and Geographers, Edward Heinemann, London.
10. Peet, Richard (1998), Modern Geographical Thought, Oxford, Blackwell Publishers.

Mapping of Course Outcomes to Program Outcomes (Geographical Thought)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-401.1	3.0	3.0	2.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	1.0
M-GEO-401.2	3.0	3.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0	2.0
M-GEO-401.3	3.0	3.0	2.0	1.0	2.0	2.0	1.0	3.0	3.0	3.0	1.0
M-GEO-401.4	3.0	3.0	2.0	1.0	2.0	2.0	1.0	3.0	3.0	3.0	1.0
Average	3.0	3.0	2.0	1.5	1.8	2.3	1.3	3.0	3.0	3.0	1.3

Mapping of Course Outcomes to Program Specific Outcomes (Geographical Thought)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-401.1	3.0	1.0	2.0	3.0
M-GEO-401.2	3.0	1.0	2.0	3.0
M-GEO-401.3	3.0	1.0	1.0	3.0
M-GEO-401.4	3.0	3.0	3.0	3.0
Average	3.0	1.5	2.0	3.0

Semester-IV
Core Course Code: M-GEO-402
Core Course Name: Hydrology and Oceanography

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-402.1: Awareness about the basic concepts and applications of hydrology.

M-GEO-402.2: Acquaintance with techniques of rainfall estimation and runoff processes.

M-GEO-402.3: Enrichment of knowledge about topographic features of oceanic floor and deposits.

M-GEO-402.4: Augmentation of knowledge about movement and circulation in oceanic water.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Definition, nature, scope, importance and historical development of hydrology.
2. Relationship of hydrology with other physical sciences.
3. Hydrological cycle, estimation of global water budget, human impact on hydrological cycle.

UNIT-II

4. Rainfall: frequency, intensity and measurement accuracy, determination of average rainfall (arithmetic mean, Thiessen polygon, isohyetal methods); types of variations in rainfall.
5. Hydrograph: components, analysis, separation methods, affecting factors; variations in runoff, rainfall-runoff relationship.

UNIT-III

6. Major topographic features of ocean basins, bottom relief of Atlantic, Pacific and Indian oceans.
7. Sources, classification and distribution of ocean deposits, corals-origin, types and conditions for development; theories of the origin of coral reefs (Subsidence and Standstill).

UNIT-IV

8. Origin, causes, types and effects of the ocean currents; currents of the Atlantic, Pacific and Indian oceans.
9. Oceanic temperature: distribution and causes of variation.
10. Composition of oceanic water and distribution of salinity.

Suggested Readings:

1. Digman, L.S. 2002. Physical Hydrology. Prentice Hall, New Jersey.
2. Lal, D.S. 2007. Oceanography. Sharda Pustak Bhawan, Allahabad.
3. Patra K.C. 2010. Hydrology and Water Resource Engineering, Norsa Publishing House, New Delhi.
4. Reddy, P.J. 1992. A Text Book of Hydrology, Laxmi Publications, New Delhi.
5. Siddhartha, K. 1999. Oceanography-A Brief Introduction, Kishalay Publications, New Delhi.
6. Singh, S. 2008. Oceanography. Prayag Pustak Bhawan, Allahabad.
7. Sharma RC and Vatal M. 1993. Oceanography for Geographers, Chaitanya Publishing House, Allahabad.
8. Subramanya, K. 1994. Engineering Hydrology, Tata McGraw-Hill Publishing Company Limited, New Delhi.
9. Ward, W.C. 1967. Principles of Hydrology, McGraw Hill, New York.

Mapping of Course Outcomes to Program Outcomes (Hydrology and Oceanography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-402.1	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0
M-GEO-402.2	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	1.0	3.0
M-GEO-402.3	3.0	3.0	3.0	1.0	1.0	2.0	1.0	2.0	3.0	1.0	1.0
M-GEO-402.4	3.0	3.0	3.0	1.0	1.0	3.0	1.0	3.0	3.0	1.0	1.0
Average	3.0	3.0	3.0	2.0	1.5	2.8	2.0	2.8	3.0	1.3	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Hydrology and Oceanography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-402.1	3.0	3.0	3.0	3.0
M-GEO-402.2	3.0	3.0	3.0	3.0
M-GEO-402.3	3.0	2.0	2.0	2.0
M-GEO-402.4	3.0	2.0	2.0	2.0
Average	3.0	2.5	2.5	2.5

Semester-IV
Elective Course Code: M-GEO-403 (i)
Elective Course Name: Regional Geography of India with Special Reference to Haryana

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

- M-GEO-403 (i).1:** Familiarization with the concept of region and regionalization.
M-GEO-403 (i).2: Awareness about macro and meso regions of India.
M-GEO-403 (i).3: Understanding about the physical and economic diversities in Haryana.
M-GEO-403 (i).4: Acquaintance with demographic characteristics and socio-economic development in Haryana.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Concept and types of regions and regionalization.
2. Regional diversities in India.
3. Critical review of schemes of regionalization of India: Baker and Stamp, Pithawala, Spate and R.L. Singh.

UNIT-II

4. Macro regions of India: Himalayas, Indo-Ganga Plains, Indian Peninsula (physical and socio-economic characteristics).
5. Bases and demarcation of meso regions of India.
6. Schemes of socio-economic regionalization: Asok Mitra, P. Sengupta and Galina Sadasyuk.

UNIT-III

7. Physical and economic diversities in Haryana
 - (i) Relief, Climate, Drainage, Soils and Natural Vegetation
 - (ii) Agriculture and its spatial organization
 - (iii) Industry, Transport and Communication
8. Regionalization of Haryana (R.L Singh).

UNIT-IV

9. Demographic characteristics and diversities in Haryana.
10. Social diversity in terms of education in Haryana.
11. Socio-economic development in Haryana.

Suggested Readings:

1. Census of India (1981) Regional Division in Haryana.
2. Census of India (2001), Administrative Atlas of Haryana.
3. Deshpande CD (1992), India: A Regional Interpretation, ICSSR and Northern Book Centre.
4. FICCI (2007), State of Infrastructure in Haryana.
5. Singh, Jasbir (1976) Agricultural Geography of Haryana, Vishal Publishers, Kurukshetra.
6. Singh, RL(1971): India-A Regional Geography, National Geographical Society, Varanasi
7. Spate OHK and ATA Learmonth (1971)-India and Pakistan, Methuen, London.
8. Tirtha R and Gopal Krishna (1996), Emerging India, Rawat Publications, Jaipur.

Mapping of Course Outcomes to Program Outcomes
(Regional Geography of India with special reference to Haryana)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-403 (i).1	3.0	1.0	3.0	1.0	2.0	1.0	1.0	1.0	3.0	1.0	2.0
M-GEO-403 (i).2	3.0	1.0	3.0	1.0	2.0	1.0	1.0	1.0	3.0	1.0	2.0
M-GEO-403 (i).3	3.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	3.0	1.0	2.0
M-GEO-403 (i).4	3.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	3.0	1.0	2.0
Average	3.0	1.5	2.5	1.5	2.0	1.5	1.0	1.5	3.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes
(Regional Geography of India with special reference to Haryana)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-403 (i).1	3.0	1.0	1.0	2.0
M-GEO-403 (i).2	3.0	1.0	1.0	2.0
M-GEO-403 (i).3	3.0	1.0	2.0	3.0
M-GEO-403 (i).4	3.0	1.0	2.0	3.0
Average	3.0	1.0	1.5	2.5

Semester-IV
Elective Course Code: M-GEO-403 (ii)
Elective Course Name: Health Geography with Special Reference to India

Time: 3 Hours

Credits: 4

Total Marks : 100

External Assessment Marks : 70

Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-303 (v).1: Understanding about the concept of health and parameters of health care.

M-GEO-303 (v).2: Enhancement of knowledge about health indicators and measurement.

M-GEO-303 (v).3: Augmentation of knowledge about health infrastructure and policies in India.

M-GEO-303 (v).4: Awareness about spatial pattern of communicable and life style diseases.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. History and development of Medical/Healthcare Geography.
2. Concept of health, its measurement and data source.
3. Environmental, ecological and social approaches in study of human health.

UNIT-II

4. Demographic change and diseases: epidemiological and demographic transition.
5. Epidemiology of communicable and non-communicable diseases.
6. Climate change and human health.

UNIT-III

7. Healthcare infrastructure: spatial organization and pattern in India.
8. National health policies in India since independence.
9. Health financing in India.

UNIT-IV

10. Food security, nutrition and hunger index.
11. Anthropometric health outcome and its pattern in India: malnutrition.
12. Demographic health outcomes in India: mortality and life expectancy.

Suggested Readings:

1. Dreze Jean, Amartya Sen (1996) Economic Development and Social opportunity, Oxford University Press, New Delhi.
2. Dreze Jean and Amartya Sen (2002) India: Development and Participation, OUP, New Delhi.
3. D.M. Smith (1973) The Geography of Social Well-being in the United States. McGraw Hill, New York.
4. G H Mooney (1986) Economics, Medicine and Health Care, Harvester Press.
5. Meade and Erickson (2006) Medical Geography, Rawat Publications, Jaipur.
6. N D McGlashan (1972) Medical Geography: Techniques and Field Studies, London.
7. National Nutrition Monitoring Bureau (2000) Dynamic Database on Diet and Nutrition, National Institute & Nutrition, Hyderabad.
8. P Anthamatten and H Hazen (2016) An Introduction to Geography of Health, Routledge publication.
9. Roger Jeffery (1989) Politics of Health in India, Cambridge University Press.
10. Sen, Amartya & Dreze Jean, Indian Development (1998): Selected Regional Perspectives, Oxford University Press, Delhi.

Mapping of Course Outcomes to Program Outcomes (Health Geography with Special Reference to India)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-303 (v).1	3.0	3.0	2.0	3.0	2.0	3.0	1.0	3.0	3.0	3.0	1.0
M-GEO-303 (v).2	3.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	1.0
M-GEO-303 (v).3	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	1.0
M-GEO-303 (v).4	3.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	2.0
Average	3.0	3.0	2.0	2.8	2.3	2.8	1.8	3.0	3.0	2.5	1.3

**Mapping of Course Outcomes to Program Specific Outcomes
(Health Geography with Special Reference to India)**

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-303 (v).1	3.0	2.0	3.0	3.0
M-GEO-303 (v).2	3.0	3.0	3.0	3.0
M-GEO-303 (v).3	3.0	2.0	2.0	3.0
M-GEO-303 (v).4	3.0	2.0	3.0	2.0
Average	3.0	2.3	2.8	2.8

Semester-IV
Elective Course Code: M-GEO-403 (iii)
Elective Course Name: Social Geography with Special Reference to India

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-403 (iii).1: Enrichment of understanding about spatial dimensions of Indian society.

M-GEO-403 (iii).2: Cognizance of caste and clan territories in India.

M-GEO-403 (iii).3: Acquaintance with linguistic and religious profile of India.

M-GEO-403 (iii).4: Awareness about social change and transformation in spatial context.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Nature and scope of social geography, its development and place among social sciences.
2. Sources and problems of data for study in social geography of India.
3. Social differentiation and region formation, social evolution, social space, social and spatial justice.

UNIT-II

4. Tribes: social formations, rural-urban and spatial distribution and impacts of development.
5. Castes: origin, caste and morphology of settlements, caste and clan territories and distribution of scheduled castes.

UNIT-III

6. Languages: classification, historical processes of diffusion and geographical distribution, linguistic regions
7. Religions: origin, historical background and spatial distribution of religious groups, minority and segregation in space, communalism.

UNIT-IV

8. Social change and transformation in India, Modernization and Sanskritization
9. Rural-urban interaction and social change.
10. Social wellbeing: overview of the concept.

Suggested Readings:

1. Ahmad, A. Social Geography, Rawat Publication, New Delhi, 1999.
2. Jean, D. and Sen, A. Economic Development and Social opportunity, Oxford University Press, New Delhi, 1996.
3. Dubey, S.C. Indian Society, National Book Trust, New Delhi, 1991.
4. Schwartzberg J. An Historical Atlas of South Asia, University of Chicago Press, Chicago, 1978.
5. Sen, A and Jean, D. Indian Development: Selected Regional Perspectives, Oxford University Press, 1996.
6. Smith, D. Geography: A Welfare Approach, Edward Arnold, London, 1977.
7. Sopher, D. An Exploration of India, Cornell University Press, 1980.
8. Rao, S. Personality of India, M.S. University Baroda, Vadodara, 1958.

Mapping of Course Outcomes to Program Outcomes (Social Geography with special reference to India)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-403 (iii).1	3.0	2.0	1.0	1.0	2.0	2.0	1.0	3.0	3.0	3.0	1.0
M-GEO-403 (iii).2	3.0	2.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0	1.0
M-GEO-403 (iii).3	3.0	2.0	2.0	1.0	1.0	2.0	2.0	3.0	3.0	2.0	2.0
M-GEO-403 (iii).4	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	1.0
Average	3.0	2.3	1.8	1.5	1.8	2.3	1.5	3.0	3.0	2.8	1.3

Mapping of Course Outcomes to Program Specific Outcomes (Social Geography with special reference to India)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-403 (iii).1	3.0	2.0	2.0	3.0
M-GEO-403 (iii).2	3.0	2.0	2.0	2.0
M-GEO-403 (iii).3	3.0	2.0	3.0	3.0
M-GEO-403 (iii).4	3.0	2.0	2.0	3.0
Average	3.0	2.0	2.3	2.8

Semester-IV
Elective Course Code: M-GEO-403 (iv)
Elective Course Name: Coastal Geomorphology

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

- M-GEO-403 (iv).1:** Understanding about fundamental concepts of coastal geomorphology.
M-GEO-403 (iv).2: Knowledge about forms of movement in oceanic water.
M-GEO-403 (iv).3: Acquaintance with processes and mechanism of marine erosion and deposition.
M-GEO-403 (iv).4: Awareness about shoreline change and coastal zone management techniques.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Nature and scope of coastal geomorphology and its Significance, Time as a factor in coastal geomorphology
2. Classification of coasts and shore: submerged and emerged coasts, classification of coasts by Johnson and Shepard.

UNIT-II

3. Waves generation and modification, waves in shallow and deep water, wave energy, waves induced currents, Tsunamis and Seiches.
4. Origin and Types of tides. Theories of origin of Tides (Equilibrium theory, Progressive wave theory and Stationary wave theory).

UNIT-III

5. Processes and mechanism of marine erosion and resultant landforms.
6. Depositional landforms: Origin, classification and distribution. (Sandy and muddy shores- beaches and beach ridge, barriers spit and bar; mudflats and marshes (salt and tidal), formation of estuaries and mangrove swamps, coastal sand dunes and deltas.

UNIT-IV

7. Shoreline change: mechanism, rates and causes.
8. Structural control of shore zone morphology.
9. Coastal zone management: mapping and monitoring of coastal changes, legal and institutional coastal regulation, effective coastal zone policies.

Suggested Readings:

1. Ahmad, E.: Coastal Geomorphology of India. Orient Longmans, Bombay, 1973.
2. Bose, A.et. al: Coastal Zone Management of West Bengal, Pub. Sea Explorers Institute, Calcutta, 1985.
3. Bird, E.C.: Coasts- An Introduction to Coastal Geomorphology, Basil- Blackwell, Oxford, 1984.
4. Davis J.L: Geographical Variation in Coastal Development. Hafner Pub.Co., New York, 1973.
5. French, P.W.: Coastal and Estuarine Management, Routledge, London, 1997.
6. John, P.: An Introduction to Coastal Geomorphology. Arnold Heinemann, London, 1984.
7. Kind. C.A.M: Beaches & Coasts, Edward Arnold, London, 1972.
8. Pethick, J.: An Introduction to coastal Geomorphology. Oxford University Press, New York, 1983.
9. Shepard, F.P. and Wanless, N.R.: Our changing Coastlines. Oxford University Press, 1971.

Mapping of Course Outcomes to Program Outcomes (Coastal Geomorphology)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-403 (iv).1	3.0	2.0	2.0	1.0	1.0	2.0	1.0	1.0	3.0	1.0	1.0
M-GEO-403 (iv).2	3.0	2.0	3.0	1.0	1.0	3.0	1.0	2.0	3.0	1.0	2.0
M-GEO-403 (iv).3	3.0	2.0	3.0	2.0	2.0	3.0	1.0	3.0	3.0	1.0	3.0
M-GEO-403 (iv).4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
Average	3.0	2.3	2.8	1.8	1.8	2.8	1.5	2.3	3.0	1.3	2.3

Mapping of Course Outcomes to Program Specific Outcomes (Coastal Geomorphology)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-403 (iv).1	3.0	1.0	1.0	3.0
M-GEO-403 (iv).2	3.0	2.0	1.0	3.0
M-GEO-403 (iv).3	3.0	3.0	2.0	3.0
M-GEO-403 (iv).4	3.0	3.0	2.0	3.0
Average	3.0	2.3	1.5	3.0

Semester-IV
Elective Course Code: M-GEO-403 (v)
Elective Course Name: Tropical Climatology

Time: 3 Hours

Credits: 4

Total Marks : 100

External Assessment Marks : 70

Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-403 (v).1: Cognizance of tropical heat balance and its global consequences.

M-GEO-403 (v).2: Enrichment of knowledge about circulation pattern and dynamics of Monsoon climates.

M-GEO-403 (v).3: Acquaintance with dynamics and distribution of rainfall in tropics.

M-GEO-403 (v).4: Awareness about impact of global warming on tropical climates and their relation with agriculture.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Nature and scope and significance of Tropical Climatology.
2. Energy balance in tropical areas
3. Temperature distribution in tropical areas.

UNIT-II

4. Atmospheric Pressure and circulation in tropical areas-Hadley Cell
5. Walker Circulation, ENSO.
6. Monsoons-Theories of origin and characteristics and areas of influence

UNIT-III

7. Tropical Cyclones-Origin and characteristics.
8. Tropical Rainfall-Dynamics and distribution.
9. Heavy Precipitation events in tropical areas

UNIT-IV

10. Tropical Climates-Classification and characteristics.
11. Tropical Climates and agriculture: Human Adaptation to Tropical Climates.
12. Impact of Global Warming on Tropical Climates and Biomass.

Suggested Readings:

1. Barry, RF and RJ Chorley (1998) Atmosphere, Weather and Climate, Routledge, London.
2. Critchfield, HJ, General Climatology. Prentice-Hall of India, New Delhi.
3. Das PK (1987) The Monsoons, NBT Publications, New Delhi.
4. Fein JS and PM Stephens (1987) Monsoons, Wiley Inter Sciences.
5. McGregor, GR and Simon Nierswold (1998) Tropical Climatology: An introduction to the Climates of the Low Latitudes, Wiley Interscience.
6. Parenti, C (2011) Tropic of Chaos: Climate Change and New Geography of Violence, Nation Books, New York
7. Robinson PJ and S Henderson (1999) Contemporary Climatology, Henow.
8. Thompson, RD and A Perry(1997)Applied Climatology, Principles and Practices, Routledge, London.
9. Trewartha, GT (1980) An Introduction to Climate. McGraw Hill Company, New York.

Mapping of Course Outcomes to Program Outcomes (Tropical Climatology)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-403 (v).1	3.0	3.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	2.0	1.0
M-GEO-403 (v).2	3.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	2.0
M-GEO-403 (v).3	3.0	3.0	3.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0	2.0
M-GEO-403 (v).4	3.0	3.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	2.0	1.0
Average	3.0	3.0	2.3	2.8	2.0	2.5	2.0	3.0	3.0	2.3	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Tropical Climatology)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-403 (v).1	3.0	2.0	3.0	3.0
M-GEO-403 (v).2	3.0	2.0	3.0	2.0
M-GEO-403 (v).3	3.0	2.0	3.0	3.0
M-GEO-403 (v).4	3.0	2.0	2.0	2.0
Average	3.0	2.0	2.8	2.5

Semester-IV
Elective Course Code: M-GEO-404 (i)
Elective Course Name: Gender Geography

Time: 3 Hours
Credits: 4

Total Marks	: 100
External Assessment Marks	: 70
Internal Assessment Marks	: 30

Course Outcomes (COs):

M-GEO-404 (i).1: Understanding about growth and evolution of gender geography.

M-GEO-404 (i).2: Awareness about feminism and gender issues.

M-GEO-404 (i).3: Acquaintance with gender gaps and empowerment of women in spatial context.

M-GEO-404 (i).4: Enhancement of knowledge about gender sensitive issues and policies in India.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Growth and evolution of the discipline; its connotation; traditional concept of interdependence between men and women; emergence of patriarchy and capitalism and post-modern feminist movement.
2. Gender based demographic structure; gender gaps in infant mortality rates; maternal mortality rate; female infanticide; gender and longevity gap- their spatial variations.

UNIT-II

3. Male-Female involvement in Economic and Social Activities; multiple roles of women in land, water and forest resource management.
4. Involvement of women in household activities, agriculture, mining, construction, industry, service and informal sectors.

UNIT-III

5. Gender gaps in social and public life: education, wage differentials in economic activities, health care and nutrition.
6. Scope for bridging gender gap: empowerment of women and education, economic opportunities, access to reproductive health services, involvement in decision making processes in development and environmental management.

UNIT-IV

7. Gender and Neo-liberalization Policies in India.
8. Making of Gender geography in India.

Suggested Readings:

1. Boserup, E(1989) Women's Role in Economic Development. Earthscan, London.
2. Dankelman, I and Davidson, J (1989) Women and Environment in the Third World. Earthscan, London.
3. Deblig, H.J (1991) Human Geography-Culture, Society and Space, John Wiley, New York.
4. Haraway, D(1991) Simians, Cyberages and Women-The Reinvention of Nature. Routledge, New York.
5. Johnston, R.J(1996), The Dictionary of Human Geography, Blackwell, Oxford,
6. Koblinsky, M (1993) The Health of Women-A Global Respective. Westview Press, Boulder.
7. Lee, D (1988) Women in Geography-A Comprehensive Bibliography. Boca Raton, Florida.
8. Lewis, R. R (1995) Femininity and Representation. Routledge, New York.
9. Momsen, JH. and Townsend, J (1987) Geography of Gender in the Third World, Albany, New York.
10. Montagu, A (1964) Man's Most Dangerous Myth-the fallacy of Race. Cleveland.
11. Reagent, A.C.and Monk J.J (1982) Women and Spatial Change. Kendell & Hund, Dubuque, Lowe.
12. Rhodda, A (1991) Women and Environment. Zed, London,
13. Seager, J. and Olson, A. Women in the world – An International Atlas.
14. Sivant, R.L (1985) Women-A World Survey, World Priorities Washington, D.C.
15. Skjelsback, I and Smith, D (2001) Gender, Peace and Conflict. Sage, London.
16. Sowell, T (1994) Race and culture-A world View. Basic Books, New York.
17. UNICEF (1990) The Lesser Child-the Girl in India. United Nations, Geneva.
18. United Nations (1991) The World's Women, 1970-1990. United Nations, New York.

Mapping of Course Outcomes to Program Outcomes (Gender Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-404 (i).1	3.0	2.0	2.0	1.0	1.0	2.0	2.0	3.0	3.0	3.0	1.0
M-GEO-404 (i).2	3.0	2.0	1.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0
M-GEO-404 (i).3	3.0	2.0	1.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0
M-GEO-404 (i).4	3.0	2.0	1.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0
Average	3.0	2.0	1.3	1.5	1.5	2.0	1.3	3.0	3.0	3.0	1.8

Mapping of Course Outcomes to Program Specific Outcomes (Gender Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-404 (i).1	3.0	1.0	2.0	3.0
M-GEO-404 (i).2	3.0	1.0	3.0	3.0
M-GEO-404 (i).3	3.0	2.0	3.0	2.0
M-GEO-404 (i).4	3.0	2.0	3.0	3.0
Average	3.0	1.8	2.8	2.8

Semester-IV
Elective Course Code: M-GEO-404 (ii)
Elective Course Name: Geography of Tourism with Special Reference to India

Time: 3 Hours

Credits: 4

Total Marks : 100

External Assessment Marks : 70

Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-404 (ii).1: Familiarization with the fundamentals of tourism geography.

M-GEO-404 (ii).2: Awareness about motivating factors of tourism.

M-GEO-404 (ii).3: Acquaintance with eco-tourism potentials and socio-economic impacts of tourism.

M-GEO-404 (ii).4: Knowledge about impact of globalization and foreign capital on tourism development.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Definition, nature, scope and significance of tourism geography.
2. Factors influencing tourism: historical, physical, socio-cultural and economic.

UNIT-II

3. Motivating factors of tourism: leisure, recreation, spiritual, attraction of site and situation.
4. Infrastructure and support system of tourism accommodation and supplementary accommodation.

UNIT-III

5. Eco-Tourism potentials in India with reference to northern mountains and plains, peninsula, coastal regions and islands.
6. Impact of tourism: physical, economic and social.

UNIT-IV

7. Environmental laws and tourism.
8. Impact of globalization and foreign capital on tourism development.
9. Government policies for tourism development.

Suggested Readings:

1. Bhatia A.K. Tourism Development; Principles and Practices. Sterling Publishers, New Delhi, 1996.
2. Bhatia, A.K. International Tourism-Fundamentals and Practices, Sterling, New Delhi, 1991.
3. Chandra R.H. Hill Tourism: Planning and Development, Kanishka Publishers, New Delhi, 1998.
4. Hunter C and Green H. Tourism and the Environment: A Sustainable Relationship, Routledge, London, 1995.
5. Kaul R.K. Dynamics of Tourism & Recreation. Inter-India, New Delhi, 1985.
6. Kaur J. Himalayan Pilgrimages & New Tourism Himalayan Books, New Delhi, 1985.
7. Lea J. Tourism and Development in the Third World, Routledge, London, 1988.
8. Molton D. Geography of World Tourism Prentice. Hall, New York, 1993.
9. Pearce D.G. Tourism To-day: A Geographical Analysis, Harlow, Longman, 1987.
10. Robinson, H. A Geography of Tourism. Macdonald and Evans, London, 1996.
11. Sharma J.K. Tourism Planning and Development – A New Perspective Kanishka Publishers, New Delhi, 2000.
12. Shaw G. and Williams A.M. Critical Issues in Tourism-A Geographical Perspective, Oxford: Blackwell, 1994.
13. Sinha P.C. Global Tourism: The Next Decade, Oxford, Butterworth, Heinemann, Oxford, 1994.
14. Voase R. Tourism: The Human Perspective Hodder & Stoughton, London, 1995.
15. Williams A.M. and Shaw G. Tourism and Economic Development- Western European Experiences, London.

Mapping of Course Outcomes to Program Outcomes (Geography of Tourism with Special Reference to India)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-404 (ii).1	3.0	3.0	2.0	2.0	2.0	2.0	1.0	2.0	3.0	1.0	2.0
M-GEO-404 (ii).2	3.0	2.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	1.0	2.0
M-GEO-404 (ii).3	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	1.0	2.0
M-GEO-404 (ii).4	3.0	2.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	1.0	2.0
Average	3.0	2.5	2.8	2.5	2.0	2.5	1.5	2.5	3.0	1.0	2.0

**Mapping of Course Outcomes to Program Specific Outcomes
(Geography of Tourism with Special Reference to India)**

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-404 (ii).1	3.0	1.0	1.0	2.0
M-GEO-404 (ii).2	3.0	1.0	1.0	2.0
M-GEO-404 (ii).3	3.0	1.0	2.0	3.0
M-GEO-404 (ii).4	3.0	1.0	2.0	3.0
Average	3.0	1.0	1.5	2.8

Semester-IV
Elective Course Code: M-GEO-404 (iii)
Elective Course Name: Cultural Geography

Time: 3 Hours

Credits: 4

Total Marks : 100

External Assessment Marks : 70

Internal Assessment Marks : 30

Course Outcomes (COs):

M-GEO-404 (iii).1: Enrichment of knowledge about main civilizations of world.

M-GEO-404 (iii).2: Enhancement of knowledge about factors and processes of cultural diversity.

M-GEO-404 (iii).3: Acquaintance with racial classification and distribution in the world.

M-GEO-404 (iii).4: Awareness about changing characteristics of Indian society in regional context.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Definition, nature and scope of Cultural Geography; cultural elements and components of culture.
2. The evolution of Human Civilizations with special reference to: Mesopotamia, the Nile Valley, the Indus Valley and the Hwang Ho Valley.

UNIT-II

3. Bases of cultural diversity and cultural transformation-race, religion and language.
4. Cultural landscape and cultural ecology.
5. The speed and efficiency of operation of cultural processes.

UNIT-III

6. Race, evolution of race, criteria of racial classification, theories of the classification of Races-Zones and Strata or Migration Zone Theory of race evolution.
7. Classification of Races: Major races of the world: Nordics, Mongoloids, Negroids and Caucasoids.
8. Racial Classification in India-Sri Risley, A.C. Haddon, B.S. Guha.

UNIT-IV

9. Tribes of India with main emphasis on Naga, Khasis, Todas, Bhils and Santhals.
10. Patterns of livelihood: Various economic activities, cultural adaptations; agriculture, industrialization and modernization, technological changes and their geographical implications.

Suggested Readings:

1. Craig, Mike (1998) Cultural Geography, Routledge Publications, London.
2. De Blij, Harm J. (1977) Human Geography, Cultural Society and Space, John Wiley and Sons, New York.
3. Dickens, S.N. (1970) Introduction to Cultural Geography, Xerox College Publishing House, Waltham, Massachusetts.
4. Magunder, D.N. (1973) Races and Culture of India, Asia Publishing House, New Delhi.
5. Mukerjee, A.B. and Aijazuddin A. (1985) India: Culture, Society and Economy, Inter-India Publications, New Delhi.
6. Spencer, J.E. and Thomas, W.L. (1973) Introducing Cultural Geography, John Wiley and Sons, New York.
7. Taylor G. (1971) The Geography in the Twentieth Century, Asia Publishing House, New Delhi.
8. Wagner, P.L. and Mikesell, M. (1962) Readings in Cultural Geography, The University of Chicago Press, Chicago.

Mapping of Course Outcomes to Program Outcomes (Cultural Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-404 (iii).1	3.0	2.0	1.0	1.0	1.0	1.0	1.0	3.0	3.0	3.0	1.0
M-GEO-404 (iii).2	3.0	3.0	1.0	1.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0
M-GEO-404 (iii).3	3.0	2.0	2.0	1.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0
M-GEO-404 (iii).4	3.0	2.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	1.0
Average	3.0	2.3	1.5	1.3	1.8	1.8	1.0	3.0	3.0	3.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Cultural Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-404 (iii).1	3.0	2.0	1.0	2.0
M-GEO-404 (iii).2	3.0	2.0	2.0	2.0
M-GEO-404 (iii).3	3.0	2.0	3.0	3.0
M-GEO-404 (iii).4	3.0	3.0	2.0	3.0
Average	3.0	2.3	2.0	2.5

Semester-IV
Elective Course Code: M-GEO-404 (iv)
Elective Course Name: Geography of Water Resources

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

- M-GEO-404 (iv).1:** Awareness about the availability of earth's water resources.
M-GEO-404 (iv).2: Familiarization with development and dynamics of water resources.
M-GEO-404 (iv).3: Ability to understand the issues and problems of water resources.
M-GEO-404 (iv).4: Augmentation of knowledge about conservation and management of water resources.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. Definition, nature, scope and importance of Water Resources Geography.
2. Distribution and changing trends in use of water in the world.
3. Status of water resources in India.

UNIT-II

4. Factors affecting demand of water, for water demand, delta and duty of water.
5. Estimation of water demand and use in agricultural sector.
6. Groundwater assessment, development and management.
7. Water pricing and its marketing, virtual and footprints of water.

UNIT-III

8. Irrigation induced waterlogging and salinity with reference to Indira Gandhi Canal project.
9. Sources, monitoring and management of water pollution.
10. Interstate water disputes-history, constitutional provisions, treaties and financial constraints.
11. Water disputes and treaties with reference to India.

UNIT-IV

12. Water harvesting techniques.
13. Watershed management.
14. Issues and challenges of inter basin transfer of water.
15. Environmental flows.
16. Resettlement issues pertaining to water resource projects.

Suggested Readings:

1. Gurjar R.K. and Jat B.C. 2008. Geography of Water Resources, Rawat Publications, Jaipur.
2. Jones, J.A. 1997. Global Hydrology-Processes, Resources and Environmental Management. Longman.
3. Michael. A.M. 1978. Irrigation: Theory and Practices. Vikas Publishing House Pvt. Ltd., New Delhi.
4. Mather, J.R. 1984. Water Resources Distribution, Use and Management. John Wiley, Maryland.
5. Newson, M. 1992. Land, Water and Development River Basin Systems and their Sustainable Management, Routledge, London.
6. Rao, K.L. 1979. India's Water Wealth. Orient Longman, New Delhi.
7. Tideman, E.M. 1996. Watershed Management; Guidelines for Indian Conditions, Omega, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Geography of Water Resources)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-404 (iv).1	3.0	2.0	3.0	2.0	1.0	3.0	1.0	3.0	3.0	1.0	1.0
M-GEO-404 (iv).2	3.0	2.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	1.0	2.0
M-GEO-404 (iv).3	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0
M-GEO-404 (iv).4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
Average	3.0	2.5	3.0	2.8	2.3	3.0	2.0	3.0	3.0	1.5	2.3

Mapping of Course Outcomes to Program Specific Outcomes (Geography of Water Resources)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-404 (iv).1	3.0	3.0	1.0	3.0
M-GEO-404 (iv).2	3.0	2.0	2.0	3.0
M-GEO-404 (iv).3	3.0	3.0	2.0	3.0
M-GEO-404 (iv).4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.0	3.0

Semester-IV
Elective Course Code: M-GEO-404 (v)
Elective Course Name: Urbanization in India

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs): On completion of the course the students will have ability to:

- M-GEO-404 (v).1:** Understanding about pattern and processes of urbanization.
M-GEO-404 (v).2: Acquaintance with contemporary urban infrastructure issues.
M-GEO-404 (v).3: Augmentation of knowledge about urban social issues.
M-GEO-404 (v).4: Awareness about urban governance issues.

Note for Paper Setters: Question 1 is compulsory comprising of seven sub parts (two marks for each sub part), to be answered in 25-30 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-I

1. History of urbanization in India: Ancient, Medieval, Colonial and post-independence phases of urbanization.
2. Processes of urbanization: Socio-cultural, political, economic and geographical processes.
3. Patterns of urbanization: settlement structure, level of urbanization, criteria of measurement and spatial patterns of urbanization in India.
4. Recent trends of urbanization in India.

UNIT-II

5. Urban housing.
6. Urban transport.
7. Water crisis and water management.
8. Urban sanitation.
9. Solid waste management.

UNIT-III

10. Urban poverty: measures of poverty, status, causes and policies.
11. Slums: current status, causes and policies.
12. Urban crime and delinquency.
13. Marginalization of poor in urban space.
14. Squeezing of urban social space.

UNIT-IV

15. Role of urbanization in economic and social change.
16. Urban land management: land acquisition problems and policies.
17. National urbanization policy.
18. Urban regions of India: case studies of metropolitan regions of Delhi, Mumbai, Kolkata, Chennai, Bangalore and Hyderabad.

Suggested Readings:

1. Ahluwalia, I.J., Kanbur, R. and Mohanty, P.K. (2014) Urbanization in India: Challenges, Opportunities and the Way Forward, SAGE India, New Delhi.
2. Alam, SM and Khan, W. (1972) Metropolitan Hyderabad and its Region: A Strategy for Development, Asia Publishing House, Bombay.
3. Amarjit, S. and Komol, S. (2020) Understanding Urbanization in Northeast India, Routledge.
4. Bhattacharya, B. (2006) Urban Development in India since Pre-Historic Times, Concept Publishing Company, New Delhi.
5. Denis, E. (2019) Subaltern Urbanization in India: An Introduction to the Dynamics of Ordinary Towns, Springer.
6. Forest, G.B. (2009) Cities of India, Shubhi publication.
7. Hust, E. and Mann, M. Urbanization and Governance in India, Manohar Publishers.
8. Kundu, A. (1992) Urban Development and Urban Research in India, Khanna Publication.
9. Mishra, R.P. (2019) Million Cities of India: Growth Dynamics, Internal Structure, Quality of Life and Planning Perspectives, IBP.
10. Purohit, A. (2011) Urbanization in India, Rosa publisher.

11. Nangia, S. (1976) Delhi Metropolitan Region: A study in Settlement Geography, Rajesh Publication.
12. Ramachandran, R.(1992) Urbanization and Urban Systems in India, Oxford press, London.
13. Rao V.L.S.P. Urbanization in India: Spatial Dimensions. Concept Publishing Co. New Delhi.
14. Rao V.L.S.P. (1979) The Structure of an Indian Metropolis: A study of Bangalore, Allied Publishers Bangalore.
15. Sharma, A.K. and Mishra, B.D.(2018) Urbanization in India: Issues and Challenges, Ane Publication, New Delhi.
16. Siva Ramakrishnan, K.C., Kundu, A. and Singh, B.N.(2005) A Handbook of Urbanization in India, Oxford University Press.

Mapping of Course Outcomes to Program Outcomes (Urbanization in India)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-404 (v).1	3.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0
M-GEO-404 (v).2	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	1.0	2.0
M-GEO-404 (v).3	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	1.0	2.0
M-GEO-404 (v).4	3.0	2.0	3.0	3.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0
Average	3.0	2.5	3.0	2.8	2.0	3.0	2.0	2.5	3.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes (Urbanization in India)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-404 (v).1	3.0	1.0	3.0	3.0
M-GEO-404 (v).2	3.0	1.0	2.0	3.0
M-GEO-404 (v).3	3.0	1.0	2.0	3.0
M-GEO-404 (v).4	3.0	1.0	2.0	3.0
Average	3.0	1.0	2.3	3.0

Semester-IV
Core Course Code: M-GEO-405
Core Course Name: Fundamentals of Geographical Information Systems (Theory)

Time: 2½ Hours
Credits: 2

Total Marks : 50
External Assessment Marks : 35
Internal Assessment Marks : 15

Course Outcomes (COs):

- M-GEO-405.1:** Acquaintance with the fundamentals of Geographical Information Systems.
M-GEO-405.2: Capability to differentiate the data types in geographical information systems.
M-GEO-405.3: Understanding about the applications of geographical information systems in resource mapping.
M-GEO-405.4: Knowledge about types and functioning of global positioning system

Note for Paper Setters: Question 1 is compulsory comprising of four sub parts (two marks for each sub part), to be answered in 25-30 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. Question 1 carries eight marks. Long questions carry nine marks each.

UNIT-I

1. GIS: definition and scope; components and elements of GIS, concept of geoid and spheroid. Coordinate projection system: implications of spherical and planar coordinate systems and their transformations in GIS.
2. Geographic data: spatial and non-spatial; spatial data structure: raster and vector; data base management system.

UNIT-II

3. Spatial analysis: overlay, neighborhood and proximity; integration of raster and vector data; applications of GIS in resource mapping and management.
4. Fundamentals of Global Positioning System (GPS): concept and principles; GPS devices; GPS system: NAVSTAR, GALILIO and GAGAN; applications of GPS.

Suggested Readings:

1. Burrough, P.A. and McDonnell, R. (1998). Principles of Geographic Information Systems. Oxford University Press, Oxford.
2. Bhatta Basudeb (2014). Remote Sensing and GIS. Oxford University Press, Oxford.
3. Chang, K.T. (2003). Introduction to Geographic Information Systems. Tata McGraw Hill Publications Company, New Delhi.
4. Demers, M. N. (2000). Fundamentals of Geographic Information Systems. John Wiley and Sons, Singapore
5. Heywood I, Cornelius S and Carver S. (2000). An Introduction to Geographical Information Systems, Longman, New York.

**Mapping of Course Outcomes to Program Outcomes
(Fundamentals of Geographical Information Systems -Theory)**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-405.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0
M-GEO-405.2	3.0	3.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	1.0	2.0
M-GEO-405.3	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	1.0	3.0
M-GEO-405.4	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0
Average	3.0	2.8	2.8	2.8	2.5	3.0	3.0	3.0	3.0	1.0	2.8

**Mapping of Course Outcomes to Program Specific Outcomes
(Fundamentals of Geographical Information Systems -Theory)**

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-405.1	2.0	3.0	3.0	3.0
M-GEO-405.2	3.0	3.0	3.0	2.0
M-GEO-405.3	2.0	3.0	3.0	3.0
M-GEO-405.4	2.0	3.0	3.0	3.0
Average	2.3	3.0	3.0	2.8

Semester-IV
Core Course Code: M-GEO-406
Core Course Name: Fundamentals of Geographical Information Systems (Practical)

Time: 3 Hours
Credits: 4

Total Marks : 100
External Assessment Marks : 70
Internal Assessment Marks : 30

Course Outcomes (COs):

- M-GEO-406.1:** Acquisition of skills to handle geographical information systems software.
M-GEO-406.2: Enhancement of skills in processing of digital imageries using techniques of GIS.
M-GEO-406.3: Awareness about GPS functioning and processes of data acquisition.
M-GEO-406.4: Acquaintance with the techniques of integrating GPS data in GIS and mobile mapping.

Note for Paper Setters: The examiner shall set four questions, two from each unit. The candidate shall attempt three questions in all, selecting at least one question from each unit.

Distribution of Marks for Evaluation

Exercise = 45 Project File Record = 10 Viva-voce = 15

UNIT-I

1. Generation of geographic framework: Georeferencing of Topographic maps with Projection, (Spheroids local & spheroids)
2. Generation of geodatabase/ spatial data base: vectorization (point, line and polygon), editing and building topology, joining non-spatial data
3. Analysis: overlay, query, proximity
4. Symbolization: chorochromatic, choropleth and point proportional.

UNIT-II

5. GPS: introduction to the GPS and different pages in GPS device.
6. Collection of GCP and mobile mapping.

Suggested Readings:

1. Burrough, P.A. and McDonnell, R. (1998). Principles of Geographic Information Systems. Oxford University Press, Oxford.
2. Bhatta Basudeb (2014). Remote Sensing and GIS. Oxford University Press, Oxford.
3. Chang, K.T. (2003). Introduction to Geographic Information Systems. Tata McGraw Hill Publications Company, New Delhi.
4. Demers, M. N. (2000). Fundamentals of Geographic Information Systems. John Wiley and Sons, Singapore
5. Heywood I, Cornelius S and Carver S. (2000). An Introduction to Geographical Information Systems, Longman, New York.

**Mapping of Course Outcomes to Program Outcomes
(Fundamentals of Geographical Information Systems -Practical)**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-406.1	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	1.0	2.0
M-GEO-406.2	3.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	1.0	2.0
M-GEO-406.3	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	1.0	3.0
M-GEO-406.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0
Average	3.0	2.8	2.8	2.8	2.5	3.0	3.0	3.0	3.0	1.0	2.5

**Mapping of Course Outcomes to Program Specific Outcomes
(Fundamentals of Geographical Information Systems -Practical)**

COs/PSOs	PSO1	PSO2	PSO3	PSO4
M-GEO-406.1	2.0	3.0	3.0	3.0
M-GEO-406.2	3.0	3.0	3.0	3.0
M-GEO-406.3	3.0	3.0	3.0	3.0
M-GEO-406.4	3.0	3.0	3.0	3.0
Average	2.8	3.0	3.0	3.0

Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes (M.Sc. Geography)

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
M-GEO-101	3.0	3.0	2.3	2.5	2.0	2.8	2.8	3.0	3.0	2.3	1.8	3.0	2.8	2.8	3.0
M-GEO-102	3.0	1.3	2.0	1.8	2.0	1.3	1.3	1.5	3.0	1.0	1.3	3.0	1.0	1.8	1.8
M-GEO-103	3.0	2.8	3.0	2.3	3.0	2.5	1.3	3.0	3.0	1.5	3.0	3.0	3.0	2.3	3.0
M-GEO-104	3.0	3.0	2.5	3.0	1.5	3.0	3.0	3.0	2.3	2.3	2.0	2.3	3.0	3.0	3.0
M-GEO-105	3.0	2.0	2.0	3.0	1.8	2.0	2.0	2.0	3.0	1.0	2.0	3.0	1.0	3.0	3.0
M-GEO-106	3.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	1.0	2.0	3.0	1.0	3.0	3.0
M-GEO-201	3.0	3.0	3.0	3.0	2.0	3.0	2.5	2.8	3.0	1.5	2.5	3.0	2.3	1.8	3.0
M-GEO-202	3.0	2.5	3.0	2.8	2.0	2.5	2.0	2.5	3.0	1.0	2.0	3.0	1.0	2.8	2.0
M-GEO-203	3.0	3.0	2.0	2.8	2.0	2.8	2.0	3.0	3.0	2.8	2.0	2.8	2.3	3.0	3.0
M-GEO-204	3.0	2.8	2.0	3.0	1.5	3.0	2.5	3.0	3.0	2.3	1.8	3.0	2.5	2.8	2.8
M-GEO-205	3.0	2.8	2.8	2.5	1.8	2.5	1.8	2.5	3.0	1.5	3.0	3.0	2.5	2.5	2.8
M-GEO-206	3.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0	2.3	3.0	2.5
M-GEO-OE-204	3.0	1.8	1.8	1.5	2.0	1.8	1.5	2.8	2.8	2.0	2.0	3.0	1.0	1.8	2.0
M-GEO-301	3.0	1.0	3.0	2.8	2.0	2.0	1.5	2.0	3.0	1.0	2.0	3.0	1.0	1.8	3.0
M-GEO-302	3.0	3.0	2.5	3.0	2.8	3.0	2.5	2.3	3.0	2.8	2.3	2.3	2.8	2.8	3.0
M-GEO-303(i)	3.0	2.5	3.0	2.8	2.0	2.8	2.3	2.0	3.0	1.0	2.3	3.0	1.0	2.3	3.0
M-GEO-303(ii)	3.0	2.8	2.3	3.0	1.8	2.5	1.5	2.8	3.0	2.0	1.3	3.0	2.5	2.5	2.0
M-GEO-303(iii)	3.0	3.0	2.5	2.8	2.3	3.0	2.3	3.0	3.0	1.8	2.3	3.0	2.8	2.3	3.0
M-GEO-303(iv)	3.0	2.8	2.3	2.3	1.8	2.3	2.8	3.0	3.0	2.3	1.8	3.0	2.3	3.0	2.3
M-GEO-303 (v)	3.0	2.3	3.0	2.8	2.0	2.3	2.3	2.5	3.0	1.0	2.0	3.0	1.0	2.3	2.8
M-GEO-304 (i)	3.0	2.8	2.8	2.5	2.0	2.3	2.0	2.3	3.0	1.0	2.0	3.0	1.0	1.8	2.5
M-GEO-304 (ii)	3.0	2.0	2.5	2.5	2.0	2.0	2.0	2.0	3.0	1.0	2.0	3.0	1.0	2.0	2.3
M-GEO-304 (iii)	3.0	2.8	2.0	2.8	2.5	3.0	2.0	2.8	3.0	1.5	3.0	3.0	2.5	3.0	3.0
M-GEO-304 (iv)	3.0	2.5	3.0	2.5	1.0	2.8	1.5	2.5	3.0	1.5	2.5	3.0	2.8	1.8	3.0
M-GEO-304 (v)	3.0	2.3	2.5	2.5	2.0	2.3	2.0	2.5	3.0	1.0	2.5	3.0	1.0	1.3	2.5
M-GEO-305	3.0	2.5	2.5	2.5	2.3	3.0	3.0	3.0	3.0	2.0	1.8	2.5	3.0	3.0	3.0
M-GEO-306	3.0	3.0	2.5	2.8	1.5	2.3	3.0	3.0	3.0	1.8	1.8	2.3	3.0	3.0	2.5
M-GEO-307	2.5	2.8	2.0	2.5	2.3	2.5	2.0	3.0	3.0	2.3	2.5	2.0	2.5	3.0	3.0
M-GEO-OE-304	3.0	1.8	1.3	1.5	1.5	1.5	1.0	2.3	2.8	2.3	1.0	3.0	1.8	1.8	2.0
M-GEO-401	3.0	3.0	2.0	1.5	1.8	2.3	1.3	3.0	3.0	3.0	1.3	3.0	1.5	2.0	3.0
M-GEO-402	3.0	3.0	3.0	2.0	1.5	2.8	2.0	2.8	3.0	1.3	2.0	3.0	2.5	2.5	2.5
M-GEO-403(i)	3.0	1.5	2.5	1.5	2.0	1.5	1.0	1.5	3.0	1.0	2.0	3.0	1.0	1.5	2.5
M-GEO-403 (ii)	3.0	3.0	2.0	2.8	2.3	2.8	1.8	3.0	3.0	2.5	1.3	3.0	2.3	2.8	2.8
M-GEO-403 (iii)	3.0	2.3	1.8	1.5	1.8	2.3	1.5	3.0	3.0	2.8	1.3	3.0	2.0	2.3	2.8
M-GEO-403(iv)	3.0	2.3	2.8	1.8	1.8	2.8	1.5	2.3	3.0	1.3	2.3	3.0	2.3	1.5	3.0
M-GEO-403 (v)	3.0	3.0	2.3	2.8	2.0	2.5	2.0	3.0	3.0	2.3	1.8	3.0	2.0	2.8	2.5
M-GEO-404 (i)	3.0	2.0	1.3	1.5	1.5	2.0	1.3	3.0	3.0	3.0	1.8	3.0	1.8	2.8	2.8
M-GEO-404 (ii)	3.0	2.5	2.8	2.5	2.0	2.5	1.5	2.5	3.0	1.0	2.0	3.0	1.0	1.5	2.8
M-GEO-404 (iii)	3.0	2.3	1.5	1.3	1.8	1.8	1.0	3.0	3.0	3.0	2.0	3.0	2.3	2.0	2.5
M-GEO-404 (iv)	3.0	2.5	3.0	2.8	2.3	3.0	2.0	3.0	3.0	1.5	2.3	3.0	2.8	2.0	3.0
M-GEO-404 (v)	3.0	2.5	3.0	2.8	2.0	3.0	2.0	2.5	3.0	1.0	2.0	3.0	1.0	2.3	3.0
M-GEO-405	3.0	2.8	2.8	2.8	2.5	3.0	3.0	3.0	3.0	1.0	2.8	2.3	3.0	3.0	2.8
M-GEO-406	3.0	2.8	2.8	2.8	2.5	3.0	3.0	3.0	3.0	1.0	2.5	2.8	3.0	3.0	3.0

Attainment of COs:

The attainment of COs can be measured on the basis of the results of internal assessment and semester examination. The attainment is measured on scale of 3 after setting the target for COs attainment. **Following table** shows the CO attainment levels assuming the set target of 60% marks:

CO Attainment Levels for internal assessment

Attainment Level	
1 (low level of attainment)	60% of students score more than 60% of marks in class tests of a course.
2 (Medium level of attainment)	70% of students score more than 60% of marks in class tests of a course.
3 (High level of attainment)	80% of students score more than 60% of marks in class tests of a course.

Note: In the above table, the set target is assumed as 60%. It may vary in different departments/institutes. The staff councils of the departments/institutes may finalize the set target.

A proper mapping of course outcomes with assessment methods should be defined before measuring the attainment level. The questions in tests for internal assessment are based on COs. Here it is assumed that class test-I is based on first two COs (i.e. **M-GEO-101.1** and **M-GEO-101.2**) of a course with equal weightage given to both COs. Similarly, class test-II is based on next two COs (i.e. **M-GEO-101.3** and **M-GEO-101.4**) of a course with equal weightage given to these two COs. For each internal assessment test, the percentage of students attaining the target level of CO is estimated and average percentage will decide the attainment level of COs. Following steps may be followed for determining the attainment level in internal assessment of a course.

- Estimate the %age of students scoring set target (say 60%) or more in the question(s) of test -I based on first CO i.e. **M-GEO-101.1**.
- Estimate the %age of students scoring set target (60%) or more in the question(s) of test-I based on second CO i.e. **M-GEO-101.2**.
- Estimate the %age of students scoring set target (60%) or more in the question(s) of test-II based on third CO i.e. **M-GEO-101.3**.
- Estimate the %age of students scoring set target (60%) or more in the question(s) of test-II based on the fourth CO i.e. **M-GEO-101.4**.
- Take average of the percentages obtained above.
- Determine the attainment level i.e. 3, 2 or 1 as per scale defined in **the above table**.

Note: In the above steps, it is assumed that internal assessment is based on two tests only. However, if internal assessment is based on more than two tests and/or on assignments then same may be incorporated to determine the COs attainment level. There may be more than four COs for a course. The set target may also be different for different COs. These issues may be resolved by the staff councils of the departments/institutes.

For determining the attainment levels for end semester examination, it is assumed that questions in the end term examination are based on all COs of the course. Attainment levels for end semester examination of a course can be determined after the declaration of the results. The CO attainment levels for end semester examination are given in **the following Table**.

CO Attainment Levels for End Semester Examination (ESE)

Attainment Level	
1 (Low level of attainment)	60% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
2 (Medium level of attainment)	70% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
3 (High level of attainment)	80% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.

Note: In the above table, the set target is assumed as grade A for CBCS courses and 60% for non-CBCS courses. It may vary in different departments/institutes. The staff councils of the departments/institutes may finalize the set target.

Overall CO Attainment level of a Course:

The overall CO attainment level of a course can be obtained as:

$$\text{Overall CO attainment level} = 50\% \text{ of CO attainment level in internal assessment} + 50\% \text{ of CO attainment level in end semester examination.}$$

The overall COs attainment level can be obtained for all the courses of the program in a similar manner.

Attainment of POs:

The overall attainment level of POs is based on the values obtained using direct and indirect methods in the ratio of 80:20. The direct attainment of POs is obtained through the attainment of COs. The overall CO attainment value as estimated above and CO-PO mapping value as shown in **Table 3** are used to compute the attainment of POs. PO attainment values obtained using direct method can be written as shown in the following Table.

PO Attainment Values using Direct Method

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
M-GEO-101											
M-GEO-102											
M-GEO-103											
M-GEO-104											
M-GEO-105											
M-GEO-106											
M-GEO-201											
M-GEO-202											
M-GEO-203											
M-GEO-204											
M-GEO-205											
M-GEO-206											
M-GEO-OE-204											
M-GEO-301											
M-GEO-302											
M-GEO-303(i)											
M-GEO-303(ii)											
M-GEO-303(iii)											
M-GEO-303(iv)											
M-GEO-303 (v)											
M-GEO-304 (i)											
M-GEO-304 (ii)											
M-GEO-304 (iii)											
M-GEO-304 (iv)											
M-GEO-304 (v)											
M-GEO-305											
M-GEO-306											
M-GEO-307											
M-GEO-OE-304											
M-GEO-401											
M-GEO-402											
M-GEO-403(i)											
M-GEO-403 (ii)											
M-GEO-403 (iii)											
M-GEO-403(iv)											
M-GEO-403 (v)											
M-GEO-404 (i)											
M-GEO-404 (ii)											
M-GEO-404 (iii)											
M-GEO-404 (iv)											
M-GEO-404 (v)											
M-GEO-405											
M-GEO-406											
Direct PO attainment	Average of above values	Average of above values	Average of above values	--	--	--	--	--	--	--	Average of above values

The PO attainment values to be filled in above table can be obtained as follows:

For B-GEO-101-PO1 Cell:

PO1 attainment value = (Mapping factor of **M-GEO-101-PO1** from **Table 3** \times Overall CO attainment value for the course **M-GEO-101**)/3

For M-GEO-201-PO1 Cell:

PO1 attainment value = (Mapping factor of **M-GEO-201-PO1** from **Table 3** \times Overall CO attainment value for the course **M-GEO-201**)/3

Similarly, values for each cell **of the above table** can be obtained. The direct attainment of POs is average of individual PO attainment values.

In order to obtain the PO attainment using indirect method, a student exit survey based on the questionnaire of POs may be conducted at end of last semester of the program. The format for the same is given **in the following table**. Average of the responses from the outgoing students for each PO is estimated.

The overall PO attainment values are obtained by adding attainment values estimated using direct and indirect methods in the proportion of 80:20 as follows:

Overall attainment value for PO1 = $0.8 \times$ average attainment value for PO1 using direct method (**from above table**) + $0.2 \times$ average response of outgoing students for PO1. Similarly, overall attainment value can be obtained for each PO.

Questionnaire for indirect measurement of PO attainment (For outgoing students)

At the end of my degree program I am able to do:

	Please tick any one		
Statement of PO1	3	2	1
Statement of PO2	3	2	1
Statement of PO3	3	2	1
Statement of PO4	3	2	1
Statement of PO5	3	2	1
Statement of PO6	3	2	1
Statement of PO7	3	2	1
Statement of PO8	3	2	1
Statement of PO9	3	2	1
Statement of PO10	3	2	1
Statement of PO11	3	2	1
3: Strongly Agree; 2: Agree; 1: Average			

Overall PO attainment values can be written as shown **in the following Table**.

Overall PO attainment Values

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Direct PO attainment											
Indirect PO attainment											
Overall PO attainment											
Target	2	2	2	2	2	1.5	2	2	2	2	1.5

The overall PO attainment values obtained above are compared with set target. The set target for each PO may be different and can be finalized by the staff councils of the departments/institutes. If overall PO attainment value is less than the set target value then an action plan may be prepared for improvement in the subsequent academic session.

The overall PSO attainment level based on CO-PSO mapping values and overall CO attainment values can be obtained in a similar manner.

Kurukshetra University, Kurukshetra Institute of Environmental Studies

M. Sc. (Environmental Science)

**Scheme and Syllabus
(Based on CBCS-LOCF Pattern)
(Effective from 2020-21 in phased manner)**



**Faculty of Life Science, KUK
(August, 2020)**

VISION AND MISSION OF THE INSTITUTE

To contribute to environmental sustainability and wise use of natural resources for the benefit of society through education, research, outreach and networking on the environment.

Programme Outcomes (POs) for PG courses of Faculty of Life Sciences

The PG Courses of Faculty of Life Sciences will be able:

PO1 To acquaint students with recent knowledge and techniques in basic and applied biological sciences.

PO2 To develop understanding of organismal, cellular, biochemical and environmental basis of life.

PO3 To provide insight in to ethical implications of biological research for environmental protection and good laboratory practices and biosafety.

PO4 To develop problem solving innovative thinking with robust communication and writing skills in youth with reference to biological, environmental and nutritional sciences.

PO5 To understand application of biotic material in health, medicine, food security for human well being and sustainable development.

PO6 To impart practical and project based vocational training for preparing youth for a career in research and entrepreneurship in fields of life sciences for self reliance

Programme Specific Outcomes of M.Sc. (Environmental Science)

- PSO1** To contribute to Environmental Sustainability and wise use of Natural Resources for benefit of society through education and research on environment with a multidisciplinary and professional approach
- PSO2** To provide knowledge on Ecology, Biodiversity Conservation, Remediation and Restoration
- PSO3** To create awareness on Pollution, Climate Change, Ecotoxicology and their linkages to human health
- PSO4** To educate students on Environmental Impact Assessment, Monitoring and Policy frameworks
- PSO5** To give knowledge on concepts, tools and modern techniques for Environmental Analysis and Management
- PSO6** To educate students on Natural Resource Management and Economics for Sustainable Development.

**KURUKSHETRA UNIVERSITY KURUKSHETRA
INSTITUTE OF ENVIRONMENTAL STUDIES
SCHEME OF EXAMINATION FOR
M.Sc. ENVIRONMENTAL SCIENCE**

First Semester

Paper code	Title of Paper	Type of paper	Hours/ week	Credits	Internal Assessment	Final Exam	Total Marks
MES-101	The Biophysical Environment	Core	4	4	20	80	100
MES-102	Environmental Chemistry	Core	4	4	20	80	100
MES-103	Ecology and Ecosystem Dynamics	Core	4	4	20	80	100
MES-104	Environmental Modelling and Statistics	Core	4	4	20	80	100
MES-105	Practical-I	Core	8	4	20	80	100
MES-106	Practical-II	Core	8	4	20	80	100
	Semester Total			24	-		600

Note 1: Each core paper final examination will be of 3 hours and practical examination will be of 6 hours duration.

Note 2: The practical classes will be held in two groups.

**KURUKSHETRA UNIVERSITY KURUKSHETRA
INSTITUTE OF ENVIRONMENTAL STUDIES
SCHEME OF EXAMINATION FOR
M.Sc. ENVIRONMENTAL SCIENCE**

Second Semester

Paper code	Title of Paper	Type of paper	Hours /week	Credits	Internal Assessment	Final Exam	Total Marks
MES-201	Natural Resource Management	Core	4	4	20	80	100
MES-202	Conservation and Biodiversity	Core	4	4	20	80	100
MES-203	Pollution and Global Climate Change	Core	4	4	20	80	100
MES-204	Environmental Methods and Analytical Techniques	Core	4	4	20	80	100
MES-205	Seminars	Core		1			25
MES-206	Water Resource Management	Open Elective	2	2	10	40	50
MES-207	Practical-III	Core	8	4	20	80	100
MES-208	Practical-IV	Core	8	4	20	80	100
	Semester Total			27			675

Note 1: Each core paper final examination will be of 3 hours and practical examination will be of 6 hours duration.

Note 2: The practical classes will be held in two groups.

**KURUKSHETRA UNIVERSITY KURUKSHETRA
INSTITUTE OF ENVIRONMENTAL STUDIES
SCHEME OF EXAMINATION FOR
M.Sc. ENVIRONMENTAL SCIENCE**

Third Semester

Paper code	Title of Paper	Type of paper	Hours/ Week	Credits	Internal Assessment	Final Exam	Total Marks
MES-301	Environmental Biotechnology	Core	4	4	20	80	100
MES-302	Remote Sensing and Geographical Information Systems	Core	4	4	20	80	100
MES-303	Ecotoxicology and Environmental Health	Core	4	4	20	80	100
MES-304	(EL-1A) Environmental Planning , Policy and Law	Elective	4	4	20	80	100
	(EL-1B) Waste Management						
MES-305	Summer training (Report +Seminar)	Core	2	2	10	40	50
MES-306	Global Climate Change	Open elective	2	2	10	40	50
MES-307	Practical-V	Core	8	4	20	80	100
MES-308	Practical-VI	Core + Elective	6	3	15	60	75
	Semester Total		34	27	-		675

- Note: (a) Each core paper final examination will be of 3 hours and practical examination will be of 6 hours duration.
- (b) The minor project in the form of summer training (4-5 weeks) with some industry/NGO/Research Institute/organization will be submitted by the student in the 3rd Semester and the student will give a presentation on the training.
- (c) The practical classes will be held in two groups.

**KURUKSHETRA UNIVERSITY KURUKSHETRA
INSTITUTE OF ENVIRONMENTAL STUDIES
SCHEME OF EXAMINATION FOR
M.Sc. ENVIRONMENTAL SCIENCE**

Fourth Semester

Paper code	Title of Paper	Type of paper	Hours /week	Credits	Internal Assessment	Final Exam	Total Marks
MES-401	Agroecology and Agroforestry	Core	4	4	20	80	100
MES-402	Environmental Impact Assessment and Auditing	Core	4	4	20	80	100
MES-403	Ecotechnology and Ecological Restoration	Core	4	4	20	80	100
MES-404	(EL-II A) Ecological Economics	Elective	4	4	20	80	100
	(EL-II B) Environmental Health and Industrial Safety						
MES-405	Practical-VII	Core	8	4	20	80	100
MES-406	Practical- VIII/ Dissertation	Core	8	4	20	80	100
	Semester Total			24	-		600

- Note: (a) Each core paper final examination will be of 3 hours and practical examination will be of 6 hours duration.
- (c) M.Sc. Dissertation will be based on scientific data collection, fieldwork as well as community participation and will be evaluated by the Internal Supervisor/Examiner and an External Examiner.
- (d) The practical classes will be held in two groups.

MES -101: THE BIOPHYSICAL ENVIRONMENT

Max. Marks: 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The aim of this course is to give information about the various aspects of biophysical components of the environment. This course gives opportunity for the students to learn about all components of physical environment including earth science, soil, atmosphere and aquatic ecosystem along with their interaction.

Outcomes: On successful completion of this course, the students will be able:

- CO1.** To acquire the knowledge and understanding of structure, functions and distribution of different components of the environment.
- CO2.** To have in-depth knowledge of the process of origination of earth with help of various theories.
- CO3.** To analyze how tectonic movement is responsible for various geographical features such as mountains, earthquake, volcanoes, trenches etc.
- CO4.** To understand the complex interactions between the land surface, atmosphere, water movement and life (flora and fauna) in sustaining the earth's biophysical environment.
- CO5.** To gather information about various parameters of meteorology and be able to predict their role in weather prediction and climate science.
- CO6.** To classify the various biogeographical zones and learn their distribution in the world.
- CO7.** To apply the knowledge of soil science, aquatic science and climate science to resolve present day environmental issues.
- CO8.** To appraise how anthropogenic factors and natural factors modify the biophysical environment.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-1

Environmental Science: Introduction, Principles and scope; environmental issues: local and global scales; man-made and natural hazards; Environment and sustainability
Environmental Education: Introduction, principles and scope; Role of NGOs in Environmental protection; environmental ethics.

UNIT-II

Earth System: Origin structure and compositions; geological time scale; basic concept of plate tectonics and continental drift.
Soil formation processes: weathering and erosion; transport and deposition of earth's material by running water, wind, glaciers. Thermal, magnetic and gravitational fields of earth.

UNIT-III

M.Sc (Environmental Science)

Atmosphere: Composition and structure; heat budget, lapse rate , thermal inversion and mixing height; cloud formation, winds, coriolis force; waves and currents; ocean circulation and global pressure belt system, El nino, La nina and monsoons,
Applied aspects of meteorology: weather and climate, spatial scales (micro, meso, synoptic and global scales), wind roses.

UNIT-IV

Environmental components and their interactions; aquatic ecosystem: Classification, salient features of fresh and marine ecosystems; Basic concepts of floristic realms and biogeographical regions; biogeographical regions of India.

Suggested Readings:

1. Botkin, D.B. and Keller E.A (2004). *Environment Science: Earth as a Living Planet*. John Wiley & Sons Inc., New York.
2. Robert E. Ricklefs (2001). *The Ecology of Nature*. Fifth Edition, W.H. Freeman and Company.
3. Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). *Ecology, Environment and Resource Conservation*, S. Chand Publishing, New Delhi.
4. Steffen, W., Sanderson, A., Tyson, P.D., Jager, J., Matson, P.M., Moore, III, B., Oldfield, F., Richardson, K., Schnellhuber, H.J., Turner, II, B.L. and Wasson. R.J (2004). *Global change and the Earth System: A Planet under Pressure*. Springer-Verlag, New York, New York, USA Reference books.

Teaching-Learning Process

- **Lectures** : Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test**: Knowledge of the students is tested through surprise tests, quiz & sessional tests.

CO-PO MAPPING for MES- 101

MES 101	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	-	-	-	-
CO2	3	-	-	-	-	-
CO3	2	3	-	-	-	2
CO4	3	1	2	2	3	-
CO5	2	-	1	1	-	-
CO6	1	-	-	-	-	-
CO7	2	2	2	3	2	2
CO8	1	1		3	-	-
Average	2.1	2	1.7	2.25	2.5	2

CO-PSO MAPPING for MES- 101

MES 101	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	-	-	-	-
CO2	2	-	-	-	-	-
CO3	2	-	-	2	2	-
CO4	3	2	2	3	1	2
CO5	2	-	3	2	2	-
CO6	2	3	-	-	-	-
CO7	2	1	3	3	3	3
CO8	1	2	3	2	2	1
Average	2.1	2	2.8	2.4	2	2

MES -102: ENVIRONMENTAL CHEMISTRY

Max. Marks: 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The course provides students an introduction to chemical processes that regulate the composition of air, water, and soil so as to understand the photochemical reactions in atmosphere and how they are influenced by human actions. The students can develop analytical and conceptual skills required for research in environmental chemistry.

Outcomes: On successful completion of this course, the students will be able to:

CO1: Obtain basic knowledge about rock forming minerals and deposits.

CO2: Develop understanding on the concept of soil composition, properties and chemistry in detail.

CO3: Learn about composition and photo-chemical reactions in the atmosphere.

CO4: Develop understanding about atmospheric reactions, greenhouse gases and global warming.

CO5: Obtain knowledge about water structure, composition, standards and aquatic microbial chemistry.

CO6: Analyze & apply the concept of thermodynamics, laws and heat transformation processes in different spheres of environment.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-I

Lithosphere and Soil chemistry: Chemical composition of the earth, origin of mineral deposits and fossil fuels, major rock forming minerals, elements and isotopes.

Soil Profiles, chemical and mineralogical composition of soils; soil organic matter, soil nutrients; soil properties of fundamental importance in soil management.

UNIT-II

Atmospheric Chemistry: Chemical composition of atmosphere- atmospheric water and CO₂; ions and radicals in atmosphere, formation of particulate matter, Photo-chemical and chemical reactions in the atmosphere, thermal inversion, particles in atmosphere; photochemical smog, acid rain, chemistry of ozone layer depletion; greenhouse gases and global warming.

UNIT III

Aquatic Chemistry: Structure and properties of water; water quality parameters, standards, chemistry of inland water bodies- lakes, streams, rivers estuaries and wetlands, solubility of gases in water, carbonate system in water, redox reaction (oxidation-reduction); aquatic microbial chemistry-a brief account.

UNIT IV

Interaction between atmosphere, hydrosphere and lithosphere; Enthalpy and First law of thermodynamics, adiabatic transformations, entropy and second law of thermodynamics,

M.Sc (Environmental Science)

absolute temperature, Carnot's cycle, Gibbs free energy, chemical potential, third law of thermodynamics, Gibbs - Donnan membrane equilibrium, phase equilibrium.

Suggested Readings:

1. Botkin, D.B. and Keller E.A (2004). *Environment Science: Earth as a Living Plant*. John Wiley & Sons Inc., New York.
2. Manahan, S.E. (2000). *Environmental Chemistry*. Seventh Edition. Lewis Publishers, New York
3. Mitsch, W.J. and Jorgensen, S.E. (eds.) (1989). *Ecological Engineering: An Introduction to Ecotechnology*. John Wiley and Sons, New York.
4. Pierzynski, G.M., Sims, J.T. and Vance, G.F. (2000). *Soils and Environmental Quality*. Second Edition. CRC press, New York.
5. Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). *Ecology, Environment and Resource Conservation*, S. Chand Publishing, New Delhi.

Teaching-Learning Process

- **Lectures** : Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test**: Knowledge of the students is tested through surprise tests, quiz & sessional tests.

CO-PO MAPPING for MES- 102

MES 102	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	1	2	1	-	-
CO2	-	1	2	1	2	1
CO3	2	1	2	1	-	-
CO4	2	2	2	1	-	1
CO5	3	2	3	1	3	1
CO6	2	1	-	1	-	2
Average	2.3	1.3	2.2	1	2.5	1.3

CO-PSO MAPPING for MES- 102

MES 102	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	-	-	-	-	1
CO2	2	-	-	-	-	2
CO3	1	-	-	1	-	1
CO4	2	-	3	-	1	-
CO5	2	2	1	2	1	2
CO6	1	-	-	-	2	-
Average	1.5	2	2	1.5	1.3	1.5

MES -103: ECOLOGY AND ECOSYSTEM DYNAMICS

Max. Marks: 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The aim of this course is to make students understand the basic concepts of ecology, structure and function of ecosystems and concepts of energy flow, biogeochemical cycles, community ecology and succession. The students will develop understanding of concepts of ecosystem development and significance of biotic interactions and ecosystem stability.

Outcomes:

CO1: Students will be exposed to the fundamental aspects of ecology.

CO2: Students will have in-depth knowledge about biotic and abiotic factors that are related to individual, population, community and ecosystem, as well as interrelationships

CO3: The students will understand and be able to analyze evolutionary changes and environmental adaptations.

CO4: Students will understand the concept of different food interactions, trophic levels, energy transfer, energy flow and sedimentary cycles.

CO5: Student will analyze the importance of various ecosystems such as territorial ecosystems, freshwater ecosystems, ocean ecosystems and wetlands.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-I

Introduction : Aims and scope of ecology, biological levels of organization-genes to biosphere; tolerance range and limiting factors, adaptations, ecotypes and ecads.

Population ecology: Characteristics, evolutionary strategies r and k selection; population growth and regulation, **Species Interactions:** Competition, mutualism, parasitism, predator-prey relations, allelopathy, behavioural ecology-a brief account.

UNIT-II

Community structure and Organization: nature of community, life-forms, vertical and horizontal stratification; functional role and niche, keystone species, ecotone and edge-effect; plant-animal interaction.

Ecological Succession –concept, primary and secondary succession; concept of climax and types of climax; changes in ecosystem properties during succession.

UNIT-III

The Ecosystem concept, biotic and abiotic components; ecosystem processes-photosynthesis and decomposition; ecological pyramids, food webs, trophic levels, energy transfer, ecological efficiencies, models of energy flow.

Biogeochemical cycles, gaseous and sedimentary cycles-carbon cycle, nitrogen cycle, sulphur cycle and phosphorus cycle, Man's impact on nutrient cycles.

UNIT-IV

Biome and aquatic systems- distribution, characteristics, climate and biota.

Distinguishing characters of forests, grasslands, and arid lands.

A brief account of lakes and wetlands, and coral reefs.

Natural and anthropogenic disturbances, Invasive species: ecology, impacts and control.

Suggested Readings:

1. Brewer, R. (1994). The Science of Ecology, Sanders College Publishing Co., Tokyo.
2. Lieth, H. and Whittaker, R.H. (Eds). (1975). *Primary Productivity of the Biosphere*. Springer-Verlag, New York.
3. Odum, E.P and Barrett, G.W. (2004). Fundamentals of Ecology. 5th edition. Thomson Brooks/Cole, Belmont, California.
4. Odum, E.P. (1983). *Basic Ecology*, W.B. Saunders, Philadelphia.
5. Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). *Ecology, Environment and Resource Conservation*, S. Chand Publishing, New Delhi.
6. Smith, R.L. (1996), Ecology and Field Biology, Harper Collins, New York.
7. Townsend, C.R., Begon, M. and Harper, J.L. (2003). *Essentials of Ecology*. Second Edition. Blackwell Publishing, Oxford.

Teaching-Learning Process

- **Lectures :** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz & sessional tests.

CO-PO MAPPING for MES- 103

MES 103	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	-	-	-	-
CO2	1	3	1	-	-	-
CO3	1	2	2	2	2	1
CO4	3	2	1	-	2	-
CO5	2	2	2	2	2	2
Average	1.8	2.4	1.5	2	2	1.5

CO-PSO MAPPING for MES- 103

MES 103	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	1	-	-	1
CO2	2	3	2	-	1	-
CO3	2	2	2	-	-	-
CO4	3	3	2	2	-	-
CO5	3	3	3	1	-	2
Average	2.6	2.8	2	1.5	1	1.5

MES -104: ENVIRONMENTAL MODELLING AND STATISTICS

Max. Marks: 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The course provides students with an introduction to the knowledge on models, its different types, different statistical technique, and softwares. The students will acquire skills in various statistical tools, techniques and models which will be used for statistical analysis and modeling of environmental systems for applications in research and industrial organizations.

Outcomes: On successful completion of this course, the students will be able to:

CO1. Understand the idea, methodology and basic tools of environmental modeling

CO2. Become aware of different modeling approaches, their scope, limitations and applications

CO3. Gain knowledge about different analytical models and their applications in Ecological Studies

CO4. Describe how basic statistical methods can be used to analyze environmental data

CO5. Have theoretical and practical understanding of different descriptive and inferential statistical tools and techniques to provide meaningful inference from environmental data.

CO6. Gain knowledge about experimental designs and computer graphics.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-I

Concept of models and ecosystem modeling; model classification- deterministic models, stochastic models steady state models dynamic models. Different stages involved in model building.

Ecosystem stability, Cybernetics and ecosystem regulation. Ecoinformatics- A brief account and scope in environmental analysis.

UNIT-II

Elementary aspects of System Analysis: Systems theory, ecological models- characteristics and applications, compartment model, matrix model, statistical model, mathematical model, energy circuit analog model. Box model, Gaussian plume model. Analytical models in Ecology: logistic model of population growth; Hardy- Weinberg model; Lotka - Volterra model of competition and predation; models of succession.

UNIT-III

Statistics- Measures of central tendency – Mean, Median, Mode, Geometric Mean and Harmonic Mean, measures of dispersion, moments, standard deviation, variance skewness and kurtosis Basic laws of probability, definition of a random variable and concept of a probability density function; binominal, poison and normal distributions.

UNIT-IV

Principles of experimental design-randomization; replication and local control, randomized block design; application of one-way and two-way analysis of variable. Correlation and linear regression of one independent variable. A basic idea of computer graphics, use of different software; information retrieval and data management.

Suggested Readings:

1. Gomez, K.A. and Gomes, A.A. (1984). Statistical Procedures for Agricultural Research, John Wiley and Sons, New York.
2. Gupta S.C. (1981). Fundamentals of Statistics, Himalaya Publishing House, Mumbai.
3. Hoshmand, A.R. (1998). Statistical Methods for Environmental and Agricultural Sciences, CRP Press, New York.
4. John, W. and Mark, M. (Eds). (2004). Environmental Modeling: Finding Simplicity in Complexity, John Wiley and Sons Inc., New York.

Teaching-Learning Process

- **Lectures :** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz & sessional tests.

CO-PO MAPPING for MES- 104

MES 104	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	-	2	-	-	-
CO2	3	-	2	2	-	-
CO3	3	1	2	2	-	-
CO4	2	1	3	2	-	2
CO5	2	1	2	2	-	3
CO6	2	-	2	1	-	3
Average	2.5	1	2.17	1.8	-	2.7

CO-PSO MAPPING for MES- 104

MES 104	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	-	1	3	1
CO2	3	-	1	-	1	1
CO3	3	3	1	-	3	-
CO4	3	-	3	2	3	-
CO5	3	-	3	2	3	-
CO6	3	3	-	-	-	1
Average	3	3	2	1.7	2.6	1

MES-201 : NATURAL RESOURCE MANAGEMENT

Max. Marks : 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The course provides students a comprehensive review of our natural resources including land, water, energy, mineral, forest, range land, fisheries and marine resources and also economically sustainable forest management designs. The students will be able to understand the importance of natural resource management and market based mechanisms for environment protection.

Outcomes: On successful completion of this course, the students will be able to:

- CO1.** Understand types, degradation and conservation of resources.
- CO2.** Acquire knowledge about land resources, soil related issues and their management.
- CO3.** Develop understanding about water resources and conservation techniques.
- CO4.** Become familiar with various sources of energy and their environmental impacts in detail.
- CO5.** Become familiar with mineral resources and their conservation strategies.
- CO6.** Obtain knowledge about forest resources, deforestation and sustainable forest management.
- CO7.** Learn about rangelands, medicinal plant resources and marine resources.
- CO8.** Develop understanding about economic categories of resources, theories and economically sustainable management of resources.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT -I

Resources: Types, Renewable & non-renewable resources; resource degradation and conservation; Human impact on natural resources.

Land resources: Land degradation and desertification; Soil erosion and control; reclamation & management of waste lands with special reference to India.

Water resources: Pools of water and hydrological cycle; Surface water, ground water, Human use of freshwater. Rain water harvesting; watershed management

UNIT -II

Energy resources: Fossil fuels, nuclear energy, solar energy, wind energy, tidal energy, geothermal energy, hydropower. Global energy consumption; Environmental impacts of various forms of energy use.

Hydrogen as a source of energy, energy from biomass, bioconversion technology, energy plantations and petro-crops. Bioenergy-Prospects in India.

Mineral resource conservation & recycling, bacterial leaching of metals from low grade ores.

UNIT -III

M.Sc (Environmental Science)

Forest resources: Forests, their importance, types, global distribution; primary and secondary products, forest resources of India. Impact of deforestation; Sustainable forest Forest Management.

Range lands: Types, uses, grassland types and management in India.

Medicinal plant resources and bioprospecting-a brief account.

Fisheries and Marine resources- a general account; aquaculture

UNIT –IV

Economics, environment and development: Economic categories of resources; the market, environment and natural resources; the economics theory- market, demand and supply relationships.

The limit of growth; cost benefit ratio; natural resources accounting; market based mechanisms for environmental protection.

Economically sustainable forest management designs- green certification, resource conservation, community forest management; ecotourism.

Economic efficient model of sustainable fisheries; designs for renewable energy resources.

Suggested Readings:

1. Brown, L. (2001). *State of the World 2001*. World watch Institute in association with Earthscan, London.
2. Chape, S., Fish, L., Fox, P. and Spalding, M. (2003). *United Nations list of protected areas*. IUCN/UNEP/World Conservation Monitoring Centre, Gland, Switzerland/Cambridge
3. Cunningham, W.P. and Cunningham, M.A. (2002). *Environmental Science: Inquiry and Applications*. A Global Concern. Tata McGraw-Hill Publishing Company, New Delhi.
4. Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). *Ecology, Environment and Resource Conservation*, S. Chand Publishing, New Delhi.

Teaching-Learning Process

- **Lectures :** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MES- 201

MES 201	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	-	-	-	-
CO2	2	1	-	-	-	1
CO3	3	1	-	-	-	2
CO4	2	1	2	-	-	1
CO5	2	1	2	2	-	2
CO6	2	1	2	2	3	-
CO7	2	1	-	-	2	-
CO8	2	1	3	-	3	2
Average	2.1	1.0	2.25	2	2.7	1.6

CO-PSO MAPPING for MES- 201

MES 201	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	2		3
CO2	3	2	2	2	2	3
CO3	3	2	2	3	2	3
CO4	3	2	2	3	2	3
CO5	3	2	2	2	2	3
CO6	3	1	2	3	2	3
CO7	3	3	2	3	2	3
CO8	3	2	2	2	3	3
Average	3	2.1	2	2.5	2.1	3

MES-202: CONSERVATION AND BIODIVERSITY

Max. Marks: 80 + 20

Total Credits-4

Time: 3 Hours

Objectives: The aim of the course is to make students aware about diversity existing at different level of biological organizations, the values and threats to biodiversity and approaches for biodiversity conservation. The students will be able to understand the significance of diversity existing at different level of biological organizations and contribution of conservation measures to sustainability.

Outcomes: On successful completion of this course, the students will be able to:

CO1. Become familiar with principles of conservation biology and acquire knowledge about levels of biodiversity.

CO2. Build an understanding about biodiversity patterns, biodiversity of mangroves, wetlands and coral reefs,

CO3. Learn about biodiversity assessment and monitoring.

CO4. Gain knowledge about biodiversity uses, services and threats to biodiversity (aquatic and marine).

CO5. Become familiar with the various biodiversity conservation strategies and approaches.

CO6. Develop knowledge about national and international efforts for biodiversity conservation.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT – I

Principles and importance of conservation biology; genetic variations, natural selection, genetic drift and gene flow, minimum viable populations, genetic swamping.

Biodiversity, magnitude, global accumulation; levels biodiversity- species, genetic and ecosystem diversity; species diversity indices, rank abundance patterns.

UNIT – II

Biodiversity gradient – latitudinal and altitudinal, regional patterns of biodiversity; factors affecting biodiversity patterns; Biodiversity and ecosystem functioning; Terrestrial and marine hotspot of biodiversity.

Biodiversity of mangroves, wetlands and coral reefs – A general account

UNIT – III

Biodiversity uses and ecosystem services; threats to biodiversity- habitat loss, habitat fragmentation, exotic species and environmental pollution; species extinction ; IUCN threat categories- global and national status; Threats to aquatic and marine biodiversity.

Endangered and threatened species of India; Biodiversity assessment and monitoring.

Unit – IV

M.Sc (Environmental Science)

In situ Biodiversity conservation strategies and approaches: Protected areas, biosphere resource, protected areas in India – Sanctuaries, national parks and biosphere resources.

Ex Situ Biodiversity conservation: Species management plans, captive breeding, field gene banks, seed gene banks, cryopreservation, gene banks.

National and international efforts for biodiversity conservation- CITES, Ramsar Convention, Convention on biological diversity, IPR and Patent rights.

Suggested Readings:

1. Chandel, K.P.S., Shukla, G. And Sharma, N. (1996). Biodiversity in Medicinal and Aromatic Plants in India Conservation and Utilization, National Bureau of Plant Genetic Resources, New Delhi.
2. Heywood, V. (ed.) (1995). Global Biodiversity Assessment. United Nations Environment Programme, Cambridge University Press, Cambridge, U.K.
3. Huston, M.A. (1994). *Biological Diversity: The Coexistence of Species on Changing Landscapes*. Cambridge University Press, Cambridge.
4. Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). *Ecology, Environment and Resource Conservation*, S. Chand Publishing, New Delhi.
5. Soule, M.E. (ed.) (1986): Conservation Biology. The Science of Scarcity and Diversity. Sinaur Associates, Inc., Sunderland, Massachusetts.

Teaching-Learning Process

- **Lectures** : Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test**: Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MES- 202

MES 202	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3	-	-	-
CO2	2	3	-	-	2	-
CO3	3	-	3	3	-	3
CO4	2	2	-	-	3	-
CO5	2	2	2	2	-	-
CO6	2	2	2	2	-	-
Average	2.3	2.4	2.5	2.3	2.5	3.0

CO-PSO MAPPING for MES- 202

MES 202	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	-	1	-	2
CO2	3	3	2	1	-	2
CO3	3	3	-	3	2	2
CO4	3	3	-	-	-	2
CO5	3	3	1	-	2	2
CO6	3	3	-	-	2	3
Average	3	3	1.5	1.7	2	2.2

MES-203: POLLUTION AND GLOBAL CLIMATE CHANGE

Max. Marks: 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The aim of this course is to impart knowledge to the students about the sources and fate of air and water pollutants and the phenomena of global climate change. The students will be able to identify different environmental pollutants and their impacts on environment and understand climate change phenomenon, adaptation and mitigation strategies.

Outcomes: On successful completion of this course, the students will be able to:

- CO1.** Understand the complex environmental issues, sources and fate of different environmental pollutants along with their effects on environment.
- CO2.** Learn the standard methods of sampling, analysis and standards set up for different environmental pollutants
- CO3.** Understand the concept of global climate change, its causes, impacts, adaptation and mitigation strategies
- CO4.** Learn the role of international and national organizations in mitigating climate change
- CO5.** Predict the environmental changes and provide simple, technological and socially acceptable solutions
- CO6.** Understand the tools to study climate change and importance of carbon trading

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-I

Air and noise Pollution : Sources, classification and properties of air pollutants, behaviour and fate of air pollutants, effects of air pollution on human health & materials, sampling and analysis of air pollutants, SO_x, NO_x, CO, Ozone, hydrocarbons and particulate matter, meteorological aspects of air pollutant dispersion, Air quality standards.

Noise pollution: Definition, sources and effects; noise-monitoring-sound level meter.

UNIT-II

Water Pollution: Sources, consequences, ecological and biochemical aspects of water pollution, characteristics of domestic, industrial and agricultural wastes, their effects on water bodies; thermal pollution. Marine pollution-a general account; water quality standards.

Soil Pollution: Soil pollution from use of fertilizers, pesticides, heavy metals, waste disposal, industrial effluents and surfactants. Detrimental effects of soil pollutants, Remedial measures for soil pollution.

UNIT -III

Global climate change: Greenhouse effect, greenhouse gases-sources, trends, radiative forcing, warming potential of gases.

CO₂ fertilization effect on plants; potential impacts of global warming – polar ice caps and melting of glaciers, sea level increase, weather extreme, ecosystems, human health, coral reef bleaching, surface ocean chemistry, biogenic calcification in oceans.

UNIT IV

Tools to study global climate change- paleoclimatic records, general circulation models, ice cores.

Mitigation strategies for global warming; biological carbon sequestration, carbon sequestration in geological formations; role of forests in soil carbon storage.

Kyoto protocol; carbon trading.

Global environmental change programmes, IPCC; Indian initiative for mitigating global climate change.

Suggested Readings:

1. Botkin, D.B. and E.A. Keller (2004). *Environment Science: Earth as a Living Planet*, John Wiley & Sons Inc., New York.
2. Miller Jr., G.T. (1997). *Environmental Science: Working With the Earth*. Wadsworth Publishing Company, Belmont, California
3. Philander, S.G. (ed.) (2008). *Encyclopedia of global warming and climate change*. 2nd edition, SAGE Publications, Inc., California.
4. Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). *Ecology, Environment and Resource Conservation*, S. Chand Publishing, New Delhi.
5. Steffen, W., A. Sanderson, P. D. Tyson, J. Jäger, P. M. Matson, B. Moore, III, F. Oldfield, K. Richardson, H. J. Schnellhuber, B. L. Turner, II, and R. J. Wasson. (2004). *Global change and the Earth system: a Planet under Pressure*. Springer-Verlag, New York, New York, USA.

Teaching-Learning Process

- **Lectures :** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MES- 203

MES 203	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	2	-	-	-
CO2	3	2	2	2	-	3
CO3	2	2	2	3	-	-
CO4	-	-	2	2	-	-
CO5	2	-	2	3	-	3
CO6	2	1	2	2	-	-
Average	2.2	2	2	2.4	-	3

CO-PSO MAPPING for MES- 203

MES 203	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	3	2	2	-
CO2	3	1	3	3	3	-
CO3	3	1	3	3	-	3
CO4	3	-	3	3	3	-
CO5	3	2	3	3	3	-
CO6	3	-	3	2	2	2
Average	3	1.5	3	2.7	2.6	2.5

MES – 204: ENVIRONMENTAL METHODS AND ANALYTICAL TECHNIQUES

Max. Marks: 80

+ 20

Total Credits: 4

Time: 3 Hours

Objectives: The aim of this course is to give the students, knowledge of conventional and modern techniques of analysis of abiotic factors of ecosystems, pollutants in environmental sampling and spectroscopic and chromatographic techniques. The students can apply the knowledge of methods and techniques in research and analysis of environment.

Outcomes: On successful completion of this course, the students will be able to:

CO1: Learn characters of vegetation and measurement of biodiversity with different methods.

CO2: Use microbiology knowledge and skills to analyze environmental problems involving microbes.

CO3: Attain knowledge about designing of molecular diagnosis of plant disease and development of transgenic plants with applications.

CO4: Describe various important issues in disease control and disease forecasting relevant in farming.

CO5: Demonstrate key practical skills in working with microbes for study and use in the laboratory as well as outside.

CO6: Demonstrate a broad and coherent knowledge and understanding of analytical chemistry and instrumental methods of analysis (photometry, spectrophotometry, chromatography)

CO7: Use spectroscopic techniques to analyze various pollutants in environment and understand theory and techniques for their measurements of pollutants

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-I

Analytic and synthetic characters of vegetation, methods of vegetation analysis; Species diversity and measurement of diversity; primary and secondary production, methods of measuring primary productivity; techniques for quantifying nitrogen fixation; estimation of ecosystem nutrient budget. Germ plasm evaluation and conservation- survey, inventorization, and analysis.

UNIT-II

Techniques in environmental microbiology and its applications.

Methods of analyzing soil microbial populations and diversity

Measurement of microbial activity in environmental samples: microbial biomass, nitrogen mineralization soil respiration, microbial respiration and enzymatic activities.

Assessment and characterization of arbuscular mycorrhizal fungal the soil-plant system.

UNIT-III

Instrumentation Principles and applications of Spectrophotometry (UV-Visible spectrophotometry, flame photometry, Atomic Absorption spectrophotometry); Chromatographic techniques (Paper chromatography, thin layer chromatography, Gas liquid chromatography, High pressure liquid chromatography, Ion exchange chromatography, Column chromatography), Fluorometry, X-ray diffraction,.

UNIT-IV

Analytical Techniques: Air, Water & Soil samples. Sampling and analysis of air pollutants. Chemical and bacteriological sampling and analysis, water quality parameters, criteria and standards. Soil analysis - sample preparation and chemical methods of soil analysis. Vocational prospects in field of environmental analysis and research

Suggested Readings:

1. Chapin, F.S., Matson, P.A. and Mooney, H.A. (2002). *Principles of Terrestrial Ecosystem Ecology*. Springer-Verlag, New York
2. Clark, R.N. (1999). *Spectroscopy of Rocks and Minerals, and Principles of Spectroscopy*. U.S. Geological Survey, Denver
3. John Wainwright and Mark Mulligan (Eds). (2004). *Environmental Modelling: Finding Simplicity in Complexity*. John Wiley & Sons Inc., New York.
4. Manahan, S.E. (2000). *Environmental Chemistry*. Seventh Edition. Lewis Publishers, New York

Teaching-Learning Process

- **Lectures :** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MES- 204

MES 204	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	-	-	-	-
CO2	3	3	2	2	3	-
CO3	3	3	2	2	3	2
CO4	1	3	2	2	2	-
CO5	3	2	3	2	2	3
CO6	3	2	3	3	-	3
CO7	3	2	3	3	-	3
Average	2.7	2.6	2.5	2.3	2.5	2.8

CO-PSO MAPPING for MES-204

MES 204	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	-	3	3	-
CO2	2	2	1	2	3	2
CO3	2	2	3	2	3	-
CO4	3	3	3	-	3	3
CO5	2	3	-	3	3	-
CO6	2	-	-	3	3	-
CO7	2	-	3	-	3	2
Average	2.3	2.6	2.5	2.6	3	2.3

**MES -206: WATER RESOURCE MANAGEMENT
(Open Elective)**

Max. Marks: 40 + 10

Total Credits: 2

Time: 3 Hours

Objectives: The purpose of the course is to provide knowledge about various water resources, their uses and types. The students will also learn about the water quality parameters and standards, waste water treatment for recycling and reuse, water conservation and management practices.

Outcomes: On successful completion of this course, the students will be able to:

- CO1** Develop an in-depth understanding of the water resources and hydrological cycle.
- CO2:** Explain various threats like pollution and exploitation of water resources
- CO3:** Explain physical, chemical and biological parameters of water quality
- CO4** Describe the appropriate rain water harvesting methods
- CO5** Understand treatment, recycling and reuse of wastewater
- CO6** Understand different techniques of water conservation and management

Note:-

For final theory exam, five questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory carrying 10 marks. The remaining four questions will be set unit-wise with two questions from each unit carrying 15 marks each. The candidates will be required to attempt Q.No.1 and any two, selecting one question from each unit.

UNIT-1

Introduction to water resources. Water use and availability: domestic use, industrial use, agricultural use, In-stream use. Hydrological cycle. Surface water. Ground water: unconfined and confined aquifer, effect of ground water usage. Threats to water resources: water pollution, flooding, overexploitation.

UNIT-II

Sustainable use of water resources. Physical, chemical and biological parameters of water quality. Water quality standards. Wastewater treatment, recycling and reuse of wastewater. Water conservation and management practices, Rain water harvesting.

Suggested Readings:

1. CPCB (Central Pollution Control Board) (1999). *Water quality Status and Statistics* (1996 and 1997). Central Pollution Control Board, New Delhi.
2. DeBarry, P.A. (2004). *Watersheds: Processes, Assessment and Management*. John Wiley and Sons, Inc, Hoboken, New Jersey.
3. Grafton R.Q. and Hussey, K. (eds.) (2011). *Water Resources Planning and Management*. Cambridge University Press.
4. Manahan, S.E. (2000). *Environmental Chemistry*. 7th Edition. Lewis Publishers, New York.
5. Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). *Ecology, Environment and Resource Conservation*, S. Chand Publishing, New Delhi.

Teaching-Learning Process

- **Lectures :** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz & sessional tests.

CO-PO MAPPING for MES- 206

MES 206 (OE)	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	2	-	-	-	-
CO2	1	2	-	-	-	-
CO3	-	3	-	-	-	-
CO4	2	-	2	2	2	1
CO5	2	-	3	3	1	1
CO6	2	-	3	2	-	1
Average	1.8	2.3	2.7	2.3	1.5	1.0

CO-PSO MAPPING for MES-206

MES 206 (OE)	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	-	-	-	3
CO2	3	-	3	-	-	2
CO3	3	-	3	3	2	-
CO4	3	-	-	-	3	3
CO5	3	-	2	2	3	2
CO6	3	2	1	2	3	3
Average	3	2.0	2.3	2.3	2.8	2.6

MES-301: ENVIRONMENTAL BIOTECHNOLOGY

Max. Marks: 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The aim of this course is to make students understand the basic techniques of biotechnology and their applications for bioremediation of contaminants and conservation of biodiversity. The students will be able to understand the recent trends in environmental biotechnology and use of phytotechnology for remediation of environmental contaminants.

Outcomes: On successful completion of this course, the students will be able to:

CO1: Understand the recent trends in environmental biotechnology and its application in different fields of bioremediation.

CO2: Explain the microbial processes for the degradation of xenobiotics and understand the role and application of biosensors to assess the pollutants in environment.

CO3: Understand the basic tools of genetic engineering and application of molecular biology techniques for characterizing the composition of microbial communities.

CO4: Explain different strategies of environmental biotechnology in forest and wasteland management.

CO5: Understand the basics of GMOs/LMOs and biosafety protocol.

CO6: Describe and evaluate the processes of biological treatment of wastewater and alternative process schemes for biological nutrient removal.

CO7: Understand the solid waste management, application of phytotechnology and composting for waste treatments.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-I

The scope of environmental biotechnology; Biodegradation of macromolecules; biodegradation of xenobiotics.

Heavy metal pollution; Bioremediation of metal contaminated soils, spilled oil and grease deposits and synthetic pesticides.

Biosensors to detect environmental pollutants.

Fermentation technology (Bioreactors).

Unit-II

Basic techniques in genetic engineering: Genetic manipulation, Restriction endonucleases.

Introduction of cloned genes into new hosts using plasmid and phage vector systems. RFLP, Polymerase chain reaction.

Environmental genomics/metagenomics - a general account.

Microbes and environmental management.

Microorganisms and organic pollutants; Extremophiles.

Unit-III

Basic concepts of genetic engineering of plants and its applications-herbicide and stress tolerant plant.

M.Sc (Environmental Science)

Biotechnological strategies in forestry and wasteland management.

Biotechnology in biodiversity conservation: gene banks, germplasm conservation and DNA banks.

Genetically modified organisms and Biosafety- a general account.

Unit-IV

Bioenergy, ethanol fermentation.

Liquid waste treatment; Biofilters, activated sludge systems; membrane bioreactors.

Biotechnological approaches for solid waste management, Vermicomposting.

Phytotechnology- terrestrial phytosystems, metal phytoremediation.

Phytotechnology-aquatic phytosystems, nutrient film techniques, algal treatment systems.

Vocational possibilities in field of Environmental Biotechnology.

Suggested Readings:

1. Evans, G.M. and Furlong J.C. (2003). Environmental Biotechnology: Theory and Application. John Wiley and Sons.
2. Glick, B.R. and Pasternak J.J. (2007). Molecular Biotechnology: Principles and Applications of Recombinant DNA. Washington, D.C. ASN Press.
3. Horton, H.R., Moran L.A., Perry M.D. and Rawn J.D. (2006). Principles of Biochemistry, Pearson Education International.
4. Metcalf and Eddy (Eds). (2003). Wastewater Engineering: Treatment and Reuse. Tata McGraw-Hill, New Delhi.
5. Sathyanarayanan. B.N and Varghese, D.B. (2007). Plant Tissue Culture Practices and New Experimental Protocols. I.K.International, New Delhi.

Teaching-Learning Process

- **Lectures :** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MES- 301

MES 301	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	3	2	3	2
CO2	3	2	3	2	3	2
CO3	3	2	2	2	3	2
CO4	2	2	2	2	3	2
CO5	2	2	3	2	3	2
CO6	2	-	3	2	-	2
CO7	2	-	3	2	3	2
Average	2.4	2.0	2.7	2	3.0	2

CO-PSO MAPPING for MES- 301

MES 301	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	-	-	2	2
CO2	2	2	3	3	3	-
CO3	3	3	-	-	3	-
CO4	3	3	-	-	3	3
CO5	3	3	-	3	2	1
CO6	3	2	3	3	3	2
CO7	3	2	3	3	3	2
Average	2.7	2.6	3	3	2.7	2

MES -302: REMOTE SENSING AND GIS

Max. Marks: 80 + 20

Total Credits: 04

Time: 3 Hours

Objectives: The course provides students with an introduction to the principles and techniques of Remote Sensing (RS) and Geographic Information Systems (GIS) and the application of these techniques to the various aspects of environment. The students will be able to understand the scope of RS and GIS technology, its application and its requirement in research and business applications. The software and technical skills obtained from this course will prepare the students for national and global employability in Geospatial domain.

Outcomes: The students will:

- CO1.** Build a foundation of Remote Sensing (RS) and Geographic Information System (GIS) as an IT tool, its scope and usage for monitoring and analyzing the changes in earth and its environment.
- CO2.** Build an understating of types, process, platforms and sensors used in RS with an emphasis on optical and microwave remote sensing.
- CO3.** Build an understating about the elements and techniques of visual image interpretation, concepts and techniques of digital image processing, photogrammetry and aerial photography.
- CO4.** Learn about details of topographic maps and its georeferencing, ground truthing and theoretical and practical aspects of global positioning system (GPS).
- CO5.** Learn about spatial and non-spatial data types and sources and its integration and analysis in a GIS environment, and problem-based designing and management of GIS projects.
- CO6.** Have a basic competence in skills with functional knowledge of the fundamentals to carry out RS and GIS based projects.
- CO7.** Become familiar with the scope of RS and GIS technology in to the spheres of environment management.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-I

Physical basis of remote sensing (Plank's law, Stefan- Boltzmann law, Wien's Displacement law, blackbody concept and scattering); electromagnetic spectrum; interaction of earth surface features with EMR; spectral reflectance; spectral signature and atmospheric windows; basic principle of Global Positioning System (GPS).

UNIT-II

Basic concepts of remote sensing and its types, resolutions, scanning technologies,

optical and microwave remote sensing; ground truth surveys; georeferencing. Visual image interpretation; digital image processing, supervised and unsupervised classification. Basic concepts of aerial photography and photogrammetry.

UNIT-III

Components and indexing of topographic sheets; Basic concept GIS; vector and raster data; GIS spatial and analytical modeling, attribute data management, processes and steps in GIS; GIS project management, architecture design, implementation strategy and, evaluation. Digital Elevation Model (DEM) and its application.

UNIT-IV

Role of Remote Sensing and GIS in Environmental Management: natural resource management (water, forests and soil), biodiversity monitoring, vegetation analysis, biomass and productivity estimation, coastal zone management, land use/land cover evaluation, wetland management, disaster management and Environment Impact Assessment (EIA), Vocational aspects geospatial domain.

Suggested Readings:

1. Campbell J.B. and Wynne R.H (2011), Introduction to Remote Sensing, 5th edition, Guilford Press, New York.
2. Harvey, F. (2009). A Primer of GIS: Fundamental Geographic and Cartographic Concepts Rawat Publication, New Delhi, India.
3. Ian H. (2010). An Introduction to Geographical Information Systems, Pearson Education, New Delhi, India.
4. Lillesand, T.M., Kiefer, R.W. and Chipman, J.W. (2015). Remote Sensing and Image Interpretation 7th edition, John Wiley and Sons, USA.

Teaching-Learning Process

- **Lectures :** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MES- 302

MES 302	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	2	3	-	3
CO2	3	-	-	3	-	3
CO3	3	-	-	3	-	3
CO4	3	-	-	3	-	3
CO5	3	-	-	3	-	3
CO6	3	-	-	3	-	3
CO7	3	-	2	3	-	3
Average	3.0	2.0	2.0	3.0	-	3.0

CO-PSO MAPPING for MES- 302

MES 302	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	3	-
CO2	2	-	-	-	3	-
CO3	2	-	-	-	3	-
CO4	2	-	-	2	3	2
CO5	2	-	-	2	3	2
CO6	2	-	-	2	3	2
CO7	3	2	2	3	3	3
Average	2.3	2.5	2.0	2.4	3.0	2.3

MES -303: ECOTOXICOLOGY AND ENVIRONMENTAL HEALTH

Max. Marks: 80 + 20

Total Credits- 4

Time: 3 Hours

Objectives: The aim of this course is to make students understand the concepts of ecotoxicology, vector and water borne diseases and strategies of sustainable development. The students will be able to understand the symptoms, epidemiology and control of different diseases and their impacts on human health.

Outcomes: The students will be able to

- CO1.** Understand the basic concept of ecotoxicology, toxic elements, their distribution, fate and biochemical aspects
- CO2.** Learn about the importance of ecological monitoring, testing methods and ecological risk assessment associated with toxic chemicals.
- CO3.** Develop the understanding of symptoms, epidemiology and control of vector borne disease and control of water borne diseases.
- CO4.** Examine various standard methods of monitoring and control of air pollution and noise pollution
- CO5.** Understand the treatment and recycling methods of sewage and waste water
- CO6.** Understand the concept and strategies of sustainable development and the sources, generation, disposal and management of solid wastes

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-I

Ecotoxicology: introduction and importance. Types of toxic elements- inorganic, organic and radionuclide. Distribution and fate of toxic substances- physical, chemical and biological processes. Dose response relationships; biomagnification, bioaccumulation. Pesticides in water. Biochemical aspects of toxicity of Arsenic, Cadmium, Lead, Mercury, Carbon Monoxide, O₃ and PAN, Insecticides, MIC, Carcinogens and Carcinogenicity.

UNIT-II

Indices of Toxicology, Detoxification; Ecological Monitoring and Tests; Ecological risk assessment of toxic chemicals. Symptoms, epidemiology and control of vector borne diseases: amoebiasis, trypanosomiasis, filariasis, leishmaniasis, schistosomiasis. Water borne diseases and their control-cholera, diarrhea. Control of Malaria, Tuberculosis Dengue, Chicken guinea and AIDS

UNIT-III

Methods of monitoring and control of air pollution, air quality standards. Sewage and waste water treatment and recycling, physico-chemical and biological parameters for water analysis, water quality standards, Noise control and abatement measures. Noise exposure levels and standards.

UNIT-IV

Concept and strategies of Sustainable development.

Sources and generation of solid wastes, their characterization, chemical composition and classification. Different methods of disposal and management of solid wastes (Biomedical wastes, E- waste and other hazardous wastes)

Recycling of waste material. Waste minimization technologies. Resource management, Disaster management.

Suggested Readings:

1. Botkin, D.B. and Keller E.A (2004). *Environment Science: Earth as a Living Planet*, John Wiley & Sons Inc., New York.
2. Carson and Rachel. (1962). *Silent Spring*, Houghton Mifflin, Boston
3. Manahan, S.E. 2000. *Environmental Chemistry*. Seventh Edition. Lewis Publishers, New York.
4. Pierzynski, G.M., Vance, G.F. and Sims, J.T. (2000). *Soils and Environmental Quality*. Second Edition. CRC press, New York.
5. Singh, J.S. and Sharma V.P. (Eds) 2005. *Glimpses of the work on environment and development in India*. Angkor New Delhi.
6. Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). *Ecology, Environment and Resource Conservation*, S. Chand Publishing, New Delhi.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MES- 303

MES 303	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	-	-	2	-
CO2	3	3	2	2	-	3
CO3	2	3	2	2	-	2
CO4	3	2	2	3	-	3
CO5	3	2	2	2	-	2
CO6	2	-	2	2	-	-
Average	2.7	2.6	2	2.2	2	2.5

CO-PSO MAPPING for MES- 303

MES 303	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	3	-	3	-
CO2	3	3	3	3	3	-
CO3	3	2	3	3	1	-
CO4	3	2	3	3	3	-
CO5	3	2	2	-	3	-
CO6	3	2	3	-	3	3
Average	3.0	2.2	2.8	3.0	2.7	3.0

MES -304: (EL - 1A) ENVIRONMENTAL PLANNING, POLICY AND LAW

Max Marks: 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The aim of this course is enable students understand the range of regulatory instruments to conserve and protect the environment; environment policies and planning and various environment related movements at national and international level. The students will be able to understand the environmental technical and legal aspects of pollution prevention.

Outcomes: It is expected that a student after taking up this course would be able

- CO1:** To acquire values and attitude towards understanding various environmental policies and constitutional framework governing environment in India.
- CO2:** To understand the concepts related to various environment planning and procedure with current situations and for future scenarios.
- CO3:** To develop skills in identifying the problems and loop-holes in policies and to understand its legal issues and legislative provisions.
- CO4:** To have in-depth knowledge of various environmental legislations in India.
- CO5:** To understand the emerging environmental issues and key international treaties for environment protection.
- CO6:** To critically analyze and apply legislations, rules and cases in context.
- CO7:** To understand judicial response to environmental issues in India

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-I

Policy Frameworks on environment in India. National Environmental Policy 2006 - Approaches, Objectives, Principles and Framework.

Policy parameters related to conserving environmental resources-forests and wildlife, Biodiversity fresh water resources and coastal resources.

Policy perspectives for land degradation and desert ecosystems.

Sustainable food policy challenges and institutional designs for improving food production

Scheme of labeling of environmentally friendly products (Ecomark)

UNIT-II

Basic concepts of Environmental Planning, Integrated land –use planning land-use patterns, urban planning-impact of population growth.

Water Resources planning in India: Ground water; water harvesting technologies; interlinking of rivers in India.

Institutional design for renewable energy resources, hazardous waste management and handling rules, 1989; resource management; disaster management.

UNIT-III

Provision in constitution of India regarding environment article 48-A and 51-A (g).

M.Sc (Environmental Science)

Environmental legislation India: Water (Prevention and Control of Pollution) Act, 1974; The Air(Prevention and Control of Pollution) Act, 1981; The Environmental Protection Act, 1986; Wild Life Protection Act 1972, 1991; Forest Conservation Act,1980; Indian Forest Act, 1982; Motor Vehicle Act,1988 (Environmental aspects). Public Liability Insurance Act, 1991 and rules, National Green Tribunal Act (2010).

Unit-IV

International Conventions and Agreements on environmental issues:

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); Convention on Biological Diversity (CBD); United Nations Convention to Combat Desertification; Ramsar Convention.

United Nations Convention on the Law of the Sea; Antarctic Treaty; Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR).

United Nations Framework Convention on Climate Change (UNFCCC); Climate change Convention and CDM; Montreal Protocol; Basel Convention - Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal.

Suggested Readings:

1. Barrow, C.J. (2005). *Environmental Management and Development*. Taylor and Francis Group, London and New York.
2. Divan S. and Rosencranz A. (2002). *Environmental law and policy in India: cases, materials and statutes*. Oxford University Press.
3. Ferrey S. (2004). *Environmental Law: Examples and Explanations*. Aspen Law & Business. Springer-Verlag New York, LLC.
4. James C., Werksman H. and Roderick P. (2006). *Improving compliance with International Environmental Law*, Earth Scan London.
5. Pushpam, K. (2005). *Economics of Environment and Development*. ANE Books, New Delhi.
6. Stavin, R.N. (2005). *Economics of the Environment: Selected Readings*. W.W. Norton and Company, London.
7. Vig, N.J. and Axelrod R.S. (Eds) (1999). *The Global Environment: Institutions, Law and Policy*. EarthScan London.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MES- 304-EL-IA

MES 304(EL-1A)	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	2	2	-	-
CO2	1	-	3	2	-	-
CO3	1	-	2	2	-	3
CO4	1	-	-	2	-	-
CO5	1	2	3	3	2	-
CO6	1	-	-	3	-	3
CO7	1	-	-	3	2	-
Average	1	2	2.5	2.4	2	3

CO-PSO MAPPING for MES- 304-EL-IA

MES 304(EL-1A)	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	-	3	-	2
CO2	3	2	2	3	-	2
CO3	3	-	-	3	2	2
CO4	3	-	-	3	-	-
CO5	3	2	3	3	2	2
CO6	3	-	-	3	2	-
CO7	3	2	2	3	-	2
Average	3	2	2.3	3	2	2

MES-304: (EL - 1B) WASTE MANAGEMENT

Max Marks: 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The purpose of this course is to impart knowledge about the essential principles of management of waste generated from different sectors in a manner to meet public health and environmental concerns. The students will learn how to advance the scientific, technical and practical aspects of waste management and recycling.

Outcomes: The students will be able to:

CO1: Understand the types, characterization and problems of municipal waste, biomedical waste, hazardous waste, e waste, industrial and other wastes.

CO2: Become aware of environment and health impacts of different types of solid wastes.

CO3: Gain the knowledge of the needs to manage waste and waste disposal techniques.

CO4: Understand the different types of waste generated from food, paper, steel etc. industries and their management processes.

CO5: Understand the role of biotechnology in waste management.

CO6: Understand the concept of waste reuse and recovery of protein, carbohydrates, biogas, and biomass for energy, oil, fats and metals.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT I

Classification of different type of Waste; its generations and characterization. MSW – Sources and generation, chemical and physical characterization and classification, different methods of disposal and management, land filling, incineration, composting, vermicomposting, energy and resource recovery.

Hazardous waste –Definition, sources, effects and management. Biomedical wastes – Definition, categories, and management.

UNIT II

Principles of Industrial waste treatment - sources of pollution physical chemical, organic and biological properties.

Manufacturing processes, flow sheets, characteristics and composition of wastes including waste reduction, treatment and disposal methods for Food Industries: Sugar, Fermentation, Meat, dairy and Rice- milling; Material Industries: Paper, Steel - Metal - plating and petroleum refineries; Miscellaneous Industries: Textile, Tanning, Fertilizers and Atomic energy plants.

UNIT III

Role of Biotechnology in waste minimization; Recovery of by-products and raw material from wastewater conversion: waste recovery and reuse, reclamation by ground water

recharge, agriculture reuse of effluent; sludge as fertilizer; recovery of protein, carbohydrates, biogas, biomass for energy, oil and fats, metal recovery, bioscrubbing.

UNIT IV

Environmental regulation for waste management: hazardous waste (management and handling) rules 1989, amendments 2000 and 2003; Batteries (management and handling) rules, 2001; Biomedical waste (management and handling) rules, 1998; Municipal solid waste (management and handling) rules, 2000; Plastic waste (management and recycling) rules, 1999.

Suggested Readings:

1. Crites R.W., Reed S.C. and Bastion R. (2000), "Land Treatment Systems for Municipal & Industrial Wastes" McGraw Hill Companies Inc.
2. Eckenfelder W.W. (Jr.) (1966). "Industrial Water Pollution Control", McGraw Hill Publications.
3. Lal B. and Reddy M.R.V.P. (2005). Wealth from waste: trends and technologies, Teri Press, New Delhi.
4. Neal K. Ostler (1998), "Industrial Waste Stream Generation", Prentice Hall.
5. Sidwick J.M and Holdom R.S. (1987). Biotechnology waste treatment and exploitation, Ellis horwood limited, England.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MES- 304 (EL-1B)

MES (304 EL-1B)	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	2	2	3	1
CO2	2	2	3	2	2	-
CO3	3	1	2	3	2	-
CO4	2	1	3	2	3	2
CO5	3	2	3	3	3	2
CO6	3	3	3	2	3	2
CO7	2	-	2	-	-	-
Average	2.4	1.8	2.6	2.3	2.7	1.8

CO-PSO MAPPING for MES- 304 (EL-1B)

MES (304 EL-1B)	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	2	3	3	2	3
CO2	2	2	3	3	2	-
CO3	2	2	3	3	3	3
CO4	2	2	3	3	3	3
CO5	2	2	3	3	3	3
CO6	2	2	3	3	3	3
CO7	2	2	2	3	3	3
Average	2	2	2.9	3	2.7	3

**MES -306: GLOBAL CLIMATE CHANGE
(Open Elective)**

Max. Marks: 40 + 10

Total Credits: 2

Time: 3 Hours

Objectives: The purpose of the course is to impart knowledge about the concept of global climate change and its impacts on environment and human health. The students will learn about various adaptation and mitigation strategies for global warming and about carbon trading.

Outcomes: On successful completion of the course, the students will be able to

CO1. Understand the concept of changing climate, sources, trends and radiative forcing of greenhouse gases

CO2. Gain knowledge of impacts of climate change on different environmental components, ecosystems and human health.

CO3. Describe various tools to study climate change and explain various mitigation strategies

CO4. Explain various national and international programs, protocols and measures to combat the problem of changing climate

Note:-

For final theory exam, five questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory carrying 10 marks. The remaining four questions will be set unit-wise with two questions from each unit carrying 15 marks each. The candidates will be required to attempt Q.No.1 and any two, selecting one question from each unit.

UNIT-1

Global climate change: Greenhouse effect, greenhouse gases: sources, trends, radiative forcing, warming potential of gases. Impacts of global warming on melting of polar ice caps and glaciers, sea level rise, weather extremes, impacts on ecosystems and human health and on coral reef bleaching

UNIT-II

Mitigation strategies for global warming; biological carbon sequestration, carbon sequestration in geological formations, role of forests in carbon sequestration; Geoengineering; Kyoto protocol, CDM and carbon trading, IPCC.

Suggested Readings:

1. IPCC (Intergovernmental Panel on Climate Change) (1990). *Climate Change: The IPCC Assessment*. Cambridge University Press, Cambridge.
2. Sorokhtin, O.G., Chilingar, G.V. and Khilyuk, L.F. (2007). *Global warming and global cooling: Evolution of climate and earth*, Elsevier, Netherland.
3. Steffen, W., Sanderson A., Tyson P.D., Jager J., Matson P.M., Moore B., Oldfield F., Richardson K., Schnellhuber H.J., Turner B.L. and Wasson R.J. (2004). *Global change and the Earth system: a Planet under Pressure*, Springer-Verlag, New York, USA.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests.

CO-PO MAPPING for MES- 306

MES 306 (OE)	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	-	-	-	-	-
CO2	3	2	-	2	3	-
CO3	3	-	3	2	-	2
CO4	3	-	3	2	-	2
Average	2.8	2	3	2	3	2

CO-PSO MAPPING for MES- 306

MES 306 (OE)	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3		3			
CO2	3	2	3	1		2
CO3	3	2	3	2	2	
CO4	3		3	2		1
Average	3	2	3	1.7	2	1.5

MES – 401: AGROECOLOGY AND AGROFORESTRY

Max. Marks: 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The aim of this course is to provide the knowledge of environment friendly agricultural techniques, importance of environment in agriculture and agroforestry and seed regulatory and certification systems. The students can apply the knowledge of agroforestry for the betterment of soil for sustainable agricultural practices and to prevent pollution.

Outcomes: Course outcomes: The students will be able to

CO1. Understand different agricultural ecosystems and sustainable agricultural practices

CO2. Understand the linkage between green revolution and environmental implications

CO3. Understand the variations in irrigation practices, problems of water logging and secondary salinization

CO4. Develop the understanding of agrochemicals, their impact, pest management techniques and biosafety issues associated with agriculture.

CO5. Understand the importance of seed quality, testing, seed regulatory and certification systems

CO6. Examine the linkage between soil productivity and crop residue management; weather and crop productivity

CO7. Examine the linkage between global warming and agriculture and food security

CO8. Understand the concept of agroforestry, classification, models and role in soil management and carbon sequestration

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Agricultural ecosystems; Agricultural practices; Green revolution-environmental implications; Ecology of shifting agriculture.

Sustainable agriculture, organic farming, eco-farming, dry-land farming, zero-tillage, bio fertilizer, plant growth promoting bacteria.

Agro biodiversity and sustainability.

Unit-II

Environmental impacts of agriculture; Soils and agriculture, Irrigation practices, water logging and secondary salinization; agrochemicals, pesticide residues.

Crop Protection: biodegradable and non-biodegradable pesticides; pesticide resistance.

Biological and ecological pest control, integrated pest management, pesticide safety and microbial insecticides.

Biosafety issues in agriculture.

The role of microbes in agriculture-beneficial root-microbial interaction.

Unit-III

Seed quality and seed testing; Hybrid seed production.
Seed regulatory and certification systems;
Soil productivity and Crop residue management.
Weather and crop productivity.
Impact of global warming on agriculture and food security.

Unit-IV

Scope and importance of Agroforestry.
Classification of agroforestry systems. Models of agroforestry systems.
Traditional agroforestry systems of India.
Agroforestry for soil management and carbon sequestration.
Agroforestry for mitigating climate change.
Agroforestry for conserving soil biodiversity.

Suggested Reading:

1. Gliessman, S.R. (2002). *Agroecosystem Sustainability: Developing Practical Strategies*. CRC Press.
2. Kumar, B.M. and Nair P.K.R. (eds.) (2006). *Tropical Homegardens: A Time-Tested Example of Sustainable Agroforestry*. Series, Advances in Agroforestry, Vol. 3. Kluwer Academic Publishers, Dordrecht, the Netherlands.
3. Lynggaard, K. (2006). *The Common Agricultural Policy and Organic Farming: An Institutional Perspective on Continuity & Change*. CAB International.
4. Newton, Paul C.D., Carran R.A., Edwards, G.R. and Niklaus, P.A. (2007). *Agroecosystems in a Changing Climate*. Advances in Agroecology Vol.12 CRC/Taylor & Francis.
5. Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). *Ecology, Environment and Resource Conservation*, S. Chand Publishing, New Delhi.
6. Young, A. (1997). *Agroforestry for Soil Management*, CAB International, UK.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz and sessional tests.

CO-PO MAPPING for MES- 401

MES 401	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	-	-	3	-
CO2	-	2	3	-	-	-
CO3	2	2	2	2	-	-
CO4	2	2	3	3	2	-
CO5	2	2	2	3	3	-
CO6	2	2	3	2	2	2
CO7	2	2	3	3	2	2
CO8	3	2	2	2	3	-
Average	2.1	2.0	2.6	2.5	2.5	2.0

CO-PSO MAPPING for MES- 401

MES 401	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	-	-	3	2
CO2	3	2	-	-	1	-
CO3	3	2	-	2	2	-
CO4	3	2	3	2	2	1
CO5	3	2	-	3	3	-
CO6	3	2	-	3	2	3
CO7	3	2	3	3	-	3
CO8	3	2	-	-	-	3
Average	3	2.1	3	2.6	2.2	2.4

MES – 402: ENVIRONMENTAL IMPACT ASSESSMENT AND AUDITING

Max Marks: 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The aim of this course is to impart knowledge on Environmental Impact Assessment process and methodology, impacts of different industries on environment, Risk Assessment, Environmental Auditing, Occupation Health and Safety and Environmental Management Systems (EMS) in India. The students will be able to apply concepts of EIA in environmental planning.

Outcomes: On completion of this course, the students will be able to:

CO1: Perform the screening and scoping of EIA based on existing requirements, evaluate the impacts and draw the conclusions from the results of EIA.

CO2: Gain an overview of legislative framework for EIA, with a focus towards its application in India.

CO3: Understand the role of EIA in decision making.

CO4: Understand the concepts of EIA and develop the professional skills necessary to enable them to undertake EIA.

CO5: Familiarize themselves through a variety of professional tools used in predicting environmental impacts.

CO6: Develop understanding through various case-studies on impact assessment and be able to relate to other fields.

CO7: Develop critical thinking for shaping strategies for environmental management planning, environment auditing and risk assessment.

CO8: Conduct various environmental and energy audits of various industries and institutions by applying this knowledge.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-I

EIA origin, development, purpose and aims; core values and principles of Ecological Impact Assessment, EIA Methodology, EIA processes: Project screening, scoping, base-line data, impact identification; prediction, evaluation, valuation of environmental impacts, mitigation. Public participation, presentation, review and decision making, monitoring and auditing. Environmental Management Plan, Environmental components of EIA.

UNIT-II

Environmental Appraisal procedures in India, Impact identification methods. Environmental impacts of mining industry; nuclear power plant, textile industry; pulp and paper industry; petroleum refining; pesticide manufacturing industry; fertilizer industry.

Case studies of EIA – Hydroelectric dam and river valley projects; thermal power plants and petroleum exploration.

UNIT-III

Risk Analysis: Definition of risk, environmental risk analysis-risk assessment and risk management. Basic steps in risk assessment - Hazard identification. Dose-response

assessment, Exposure assessment, Risk characterization, Risk assessment in EIA. Strategic Environmental Assessment (SEA)-principles and potential, improving the effectiveness of EIA.

UNIT-IV

Aims and objectives of public involvement in EIA; Public involvement methods; approaches for EIA reviewing; Economic efficiency and valuation methods.

Types of environmental audits: Assessment and compliance audit, occupation health and safety; Energy audits. ISO 14001; Environmental Management systems in India;

Drivers for the development of audit programme. General audit process- preparation, excretions, performance valuation and execution. Environmental risk insurance; Environmental audit and EIA, Vocational prospects in the field of EIA, Auditing and EMS.

Suggested Readings:

1. Canter, L.W. (1996). *Environmental Impact Assessment*. 2nd edition, McGraw–Hill, New York.
2. Glasson, J., Therivel R. and Chadwick A. (1994). *Introduction to Environmental Impact Assessment*. UCL Press. London.
3. Morgan, R.K. (2002). *Environmental Impact Assessment: A Methodological Perspective*, Kluwer Academic Publishers, London.
4. Morris, P. and Thesivel, R. (eds.) (2001). *Methods in Environmental Impact Assessment*. UCL Press, London.
5. Therivel, R., Wilson E., Thompson O., Heaney D. and Pritchard D. (1992). *Strategic Environmental Assessment*. Earthscan, London.
6. Treweek, J. (1999). *Ecological Impact Assessment*. Blackwell Science, UK.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz & sessional tests.

CO-PO MAPPING for MES- 402

MES 402	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	-	2	2	-	3
CO2	2	-	-	2	-	-
CO3	3	-	-	2	2	-
CO4	3	2	3	2	-	2
CO5	3	2	3	2	-	2
CO6	2	-	2	3	2	3
CO7	2	2	3	3	-	2
CO8	2	-	-	3	-	3
Average	2.5	2	2.6	2.4	2	2.5

CO-PSO MAPPING for MES- 402

MES 402	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	-	3	2	-
CO2	3	-	-	3	2	-
CO3	3	-	-	3	2	-
CO4	3	-	-	3	2	-
CO5	3	2	2	3	2	-
CO6	3	2	2	3	2	2
CO7	3	-	-	3	2	2
CO8	3	-	-	3	2	2
Average	3	2	2	3	2	2

MES – 403: ECOTECHNOLOGY AND ECOLOGICAL RESTORATION

Max. Marks: 80 + 20

Total Credits: 4

Time: 3 Hours

Objectives: The aim of this course is to make students aware about the concepts of ecotechnology and strategies for restoration of terrestrial and aquatic ecosystems. The students will be able to understand the principles and applications of ecotechnology for restoration of different ecosystems with the help of case studies.

Outcomes: The student will be able to

- CO1.** Understand the basic concept of ecological principles and their applications in ecosystem restoration
- CO2.** Understand the sources and effects of natural and anthropogenic disturbances on aquatic and terrestrial ecosystems
- CO3.** Learn about various strategies of restoration of degraded, salt affected and water logged areas.
- CO4.** Understand and apply the concept of biosaline agriculture, its scope and importance for resource conservation
- CO5.** Understand and apply the concept of Integrated watershed management and its restoration
- CO6.** Understand the mitigation strategies of invasive species with the help of case studies.
- CO7.** Understand the restoration of Coastal ecosystems, wetlands, riparian and floodplain ecosystems with case studies.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Basic principles and applications of Ecotechnology.

Restoration Ecology-Terms and definitions, Importance of ecological restoration: Strategies of Restoration-Natural recovery, active restoration, rehabilitation; Restoration plan and rehabilitation measures; Reference ecosystem.

Natural and anthropogenic disturbances: Characteristics and sources, effects on structure and functioning of terrestrial and aquatic ecosystems. Habitat fragmentation, Ecosystem Stability and regulation.

Global change and Human impact on ecological systems.

Unit-II

Physical, Chemical, Biological tools of restoration. Ecological design principles.

Restoration of soil fertility of degraded lands: No-tillage, role of mycorrhizae, forestry Plantations, biofertilizers.

Rehabilitation of salt affected soils and water logged soils.

Biosaline agriculture- Scope and importance and strategies.

Unit-III

Ecological restoration of forest and grassland ecosystems.
Forest landscape restoration; Basic concepts and case studies.
Reclamation of mining sites and disturbed lands.
Integrated watershed management and restoration.
Prevention and mitigation of invasive species.

Unit-IV

Ecological restoration of aquatic systems: River corridors, wetlands and lakes.
Coastal restoration- mangroves and coral reefs.
Rehabilitation of Tsunami affected areas- a general account
Treatment wetlands, Constructed wetlands and adaptive restoration of wetlands.
Restoration of riparian and floodplain ecosystems.

Suggested Readings :

1. Botkin, D.B. and E.A. Keller (2004). Environment Science: Earth as a Living Planet, John Wiley & Sons Inc., New York.
2. Mitsch, W.J. and Jorgensen, S.E 2003. Ecological engineering and Ecosystem restoration. ical Perspective. John Wiley and Sons, New York.
3. Mitsch, W.J. and Jorgensen, S.E. (eds.) 1989. *Ecological Engineering: An Introduction to Ecotechnology*. John Wiley and Sons, New York.
4. Pace, M.L. and Groffman, P.M. (Eds.) (1998). Success, limitations and Frontiers in Ecosystem Science, Springer Verlag, New York.
5. Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). *Ecology, Environment and Resource Conservation*, S. Chand Publishing, New Delhi.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz and sessional tests.

CO-PO MAPPING for MES- 403

MES 403	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	2	2	-	-
CO2	-	2	2	2	-	-
CO3	3	2	2	2	-	2
CO4	2	2	2	2	2	2
CO5	2	2	2	2	-	2
CO6	2	2	2	2	-	3
CO7	2	2	2	2	-	-
Average	2.3	2.0	2	2	2	2.3

CO-PSO MAPPING for MES- 403

MES 403	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	-	-	-	1
CO2	3	3	2	2	-	-
CO3	3	3	-	-	2	-
CO4	3	3	-	-	2	2
CO5	3	2	-	-	2	2
CO6	3	2	-	-	2	2
CO7	3	2	-	-	2	2
Average	3	2.6	2	2	2	1.8

MES - 404: (EL-IIA) ECOLOGICAL ECONOMICS

**Max. Marks: 80
+ 20**

Total Credits: 4

Time: 3 Hours

Objectives: The course provides the students knowledge on the principles of ecological economics and sustainability, physical and economic valuation of environment, market based mechanisms and various models of sustainability. The students will develop a demonstrated theoretical knowledge of ecological economics, and its possible contribution to a vision of a sustainable planet.

Outcomes: On completion of this course, the students will be able to:

CO1 Understand the concepts of market and the economics of our environment.

CO2 Develop an understanding and use of cost-benefit analysis of environmental components and different valuation techniques to measure economic value of ecological goods and services.

CO3 Develop an ability to identify the role of market based instruments to deal with environmental issues and the concepts of environmental accounting.

CO4 Understand in-depth concepts of sustainable development, its indicators, and the challenges to meet sustainable development.

CO5 Attain knowledge about the strategies and actions adopted at national and global scale to attain sustainability.

CO6 Develop skills to learn and analyze different instruments and models to achieve sustainability.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Scope and importance of ecological economics. Economics and environmental policy; the market mechanisms and choices; benefits of environmental protection. Demand and Supply; market price and quality. Environmental externalities and the problem of social cost. Ecosystem services and their valuation. Value addition in agriculture crops; Agricultural marketing. Industrial ecology - concepts, material flow analysis and life cycle analysis

Unit-II

Economic analysis of climate change. Benefits of controlling greenhouse gases; cost of controlling greenhouse gases; carbon trading and CDM mechanisms. Measuring the costs and benefits of pollution control. Overview of benefit-cost analysis; Economic principles of cost benefit analysis; Measurement of economic value of environment: contingent valuation method, Travel cost methods, Hedonic market methods. Market based instruments for controlling pollution; Systems of Integrated environmental accounting; Green accounting.

Unit-III

M.Sc (Environmental Science)

Definition and dimensions of sustainability; global challenges of sustainable development; ecological footprint; global environmental monitoring and assessment. Guiding principles of sustainable development. Strategies for global sustainability; national sustainable development strategies; sustainability indicators. Models of sustainability, environmental sustainability index; Global action and sustainable development; Education for Sustainability.

Unit-IV

Ecological and economic sustainability of natural resources. An economic perspective to sustainability. Instruments for implementing sustainability- Findings right prices, The Hardwick- Solow Rule, Critical rental capital; Safe Minimum Standard; Daly's Steady State principles, World Bank Approach, Common and Perrings model. Policy implications for implementing sustainability.

Suggested Readings:

1. Harris J.M. and Roach, B. (2009). The Economics of Global Climate Change. Global Development and Environment Institute, Tufts University, Medford, USA.
2. Harris, J. and Roach, B. (2014). Environmental and Natural Resource Economics: A Contemporary Approach, 3rd edition, Routledge.
3. Harris, J.M., Wise, T.A., Gallagher, K.P. and Goodwin, N.R. (2001). A Survey of Sustainable Development: Social and Economic Dimensions. Island Press, Washington, D.C.
4. Smith, S. (2011). Environmental Economics: A Very Short Introduction, Oxford.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz and sessional tests.

CO-PO MAPPING for MES- 404 (EL-IIA)

MES 404-EL-IIA	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	-	-	-	-	-
CO2	2	1	-	2	-	2
CO3	2	2	2	2	-	3
CO4	2	-	2	2	3	2
CO5	2	-	-	2	2	-
CO6	2	-	-	2	-	3
Average	2	1.5	2	2	2.5	2.5

CO-PSO MAPPING for MES- 404 (EL-1A)

MES 404-EL-IIA	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	-	-	-	3
CO2	3	2	2	-	3	3
CO3	3	2	2	3	3	3
CO4	3	-	-	-	-	3
CO5	3	-	-	-	3	3
CO6	3	-	-	-	3	3
Average	3	2	2	3	3	3

MES - 404: (EL-II B) ENVIRONMENTAL HEALTH AND INDUSTRIAL SAFETY

Max. Marks: 80+20
Total Credits: 4
Time: 3 Hours

Objectives: The course provides students an overview of the basic concepts of Environmental health and epidemiology of different diseases. The students will develop understanding of chemical hazards, industrial safety and preparedness; and acquire knowledge regarding occupational health, safety rules and accident prevention.

Outcomes: The students will be able to:

- CO1:** Understand causes, and control measure of environmental and transmissible diseases.
- CO2:** Attain knowledge of unwanted incidents using root cause analysis and generate corrective and preventive action to prevent recurrence and occurrence of such incidents.
- CO3:** Identify accident prone areas and adopt methods for reducing accidents following safety precautions by using specific personal protective equipments.
- CO4:** Identify and apply safety policy in an industry and list out the duties and implement safety targets, objectives, standards, practices and performances.
- CO5:** Gain knowledge of engineering fundamentals for hazard identification, risk assessment and control of occupational hazards.
- CO6:** Help in implementation of legislative requirements, industry standards, and best practices in a variety of workplaces.

Note:-

For final theory exam time allowed will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Introduction, Environmental Epidemiology, Agents of Environmental diseases: Zoonotic and water-borne disease (Jaundice and diarrhea); Toxic metals and elements; Pesticides and other organic compounds.

Transmissible diseases: Symptoms, epidemiology and control of vector borne diseases amoebiasis, trypanosomiasis, filariasis, leishmaniasis, schistosomiasis, life cycle of Plasmodium, Control of malaria, and tuberculosis. Bio-Terrorism.

Unit-II

Occupational Health: Concept of health and occupational health, Spectrum of health, Occupational and work related diseases; Levels of prevention, History of occupational health, Characteristics of occupational diseases, Essentials of occupational health service, personal protective equipments for head, ear, face, eye, foot, knee and body protection, Respiratory personal protective devices.

Unit-III

Introduction to Industrial safety: Safety legislation: Acts and rules, Safety standards and codes, Bureau of Indian standards on safety and health 14489 - 1998 and 15001 – 2000, Safety policy: safety organization and responsibilities and authorities of different levels. ILO Convention and Recommendations in the furtherance of safety, health and welfare. Vocational prospects in Industrial Safety

Unit-IV

Hazardous Chemicals: -Classification of hazardous chemicals, transportation of hazardous chemicals, hazchem code, Storage and handling of hazardous substances and Industrial wastes, Major accidents involving hazardous substances, Emergency preparedness (on site & offsite), and Safety audit.

Suggested Reading:

1. Jain R.K. and Rao S.S. (2006), Industrial Safety , Health and Environment Management Systems, Khanna publishers, New Delhi.
2. Slote.L, Handbook of Occupational Safety and Health, John Willey and Sons, New York.
3. Lees F.P (1991) – Loss of prevention in Process Industries , Vol. 1 and 2, Butterworth-Heinemann Ltd., London.
4. Grimaldi and Simonds (2001). Safety Management, AITBS Publishers, New Delhi.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz and sessional tests.

CO-PO MAPPING for MES- 404 (EL-IIB)

MES 404-EL-IIB	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	2	2	-	-
CO2	1	-	-	2	-	2
CO3	-	-	-	2	-	3
CO4	2	-	3	2	-	3
CO5	-	-	-	2	-	3
CO6	-	-	-	-	-	3
Average	1.7	2	2.5	2	-	2.8

CO-PSO MAPPING for MES- 404 (EL-IIB)

MES 404-EL-IIB	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	2	3	-	-	-
CO2	2	-	3	3	2	-
CO3	2	-	3	3	2	-
CO4	3	-	3	3	2	-
CO5	3	2	3	3	2	-
CO6	3	-	2	3	3	2
Average	2.5	2	2.8	3	2.2	2

CO-PO-PSO Matrix for M.Sc (Environmental Science)

	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
MES-101	2.1	2.0	1.7	2.3	2.5	2.0	2.1	2	2.75	2.4	2.0	2.0
MES 102	2.3	1.3	2.2	1.0	2.5	1.3	1.5	2	2	1.5	1.3	1.5
MES103	1.8	2.4	1.5	2.0	2.0	1.5	2.6	2.8	2.0	1.5	1.0	1.5
MES104	2.5	1.0	2.2	1.8	-	2.7	3.0	3.0	2.0	1.5	2.6	1.0
MES201	2.1	1.0	2.3	2.0	2.7	1.6	3.0	2.1	2.0	2.5	2.1	3.0
MES202	2.3	2.4	2.5	2.3	2.5	3.0	3.0	3.0	1.5	1.7	2.0	2.2
MES203	2.2	2.0	2.0	2.4	-	3.0	3.0	1.5	3.0	2.7	2.6	2.5
MES204	2.7	2.6	2.5	2.3	2.5	2.8	2.3	2.6	2.5	2.6	3.0	2.3
MES206	1.8	2.3	2.7	2.3	1.5	1.0	3.0	2.0	2.3	2.3	2.8	2.6
MES301	2.4	2.0	2.7	2.0	3.0	2.0	2.7	2.6	3.0	3.0	2.7	2.0
MES302	3.0	2.0	2.0	3.0	-	3.0	2.3	2.5	2.0	2.4	3.0	2.3
MES303	2.7	2.6	2.0	2.2	2.0	2.5	3.0	2.2	2.8	3.0	2.7	3.0
MES304 EL-1A	1.0	2.0	2.5	2.4	2.0	3.0	3.0	2.0	2.3	3.0	2.0	2.0
MES304 EL-1B	2.4	1.8	2.6	2.3	2.7	1.8	2.0	2.0	2.9	3.0	2.7	3.0
MES306	2.8	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	1.7	2.0	1.5
MES401	2.1	2.0	2.6	2.5	2.5	2.0	3.0	2.1	3.0	2.6	2.2	2.4
MES402	2.5	2.0	2.6	2.4	2.0	2.5	3.0	2.0	2.0	3.0	2.0	2.0
MES403	2.3	2.0	2.0	2.0	2.0	2.3	3.0	2.6	2.0	2.0	2.0	1.8
MES404 EL-IIA	2.0	1.5	2.0	2.0	2.5	2.5	3.0	2.0	2.0	3.0	3.0	3.0
MES404 EL-IIB	1.7	2.0	2.5	2.0	-	2.8	2.5	2.0	2.8	3.0	2.2	2.0

**Kurukshetra University, Kurukshetra
Institute of Environmental Studies**

**M. Tech.
(Energy & Environmental Management)**

**Scheme and Syllabus
(Based on CBCS-LOCF Pattern)
(Effective from 2020-21 in phased manner)**



**Faculty of Life Science, KUK
(August, 2020)**

VISION AND MISSION OF THE INSTITUTE

To contribute to environmental sustainability and wise use of natural resources for the benefit of society through education, research, outreach and networking on the environment.

Programme Outcomes (POs) for PG courses of Faculty of Life Sciences

The PG Courses of Faculty of Life Sciences will be able:

PO1 To acquaint students with recent knowledge and techniques in basic and applied biological sciences.

PO2 To develop understanding of organismal, cellular, biochemical and environmental basis of life.

PO3 To provide insight in to ethical implications of biological research for environmental protection and good laboratory practices and biosafety.

PO4 To develop problem solving innovative thinking with robust communication and writing skills in youth with reference to biological, environmental and nutritional sciences.

PO5 To understand application of biotic material in health, medicine, food security for human well being and sustainable development.

PO6 To impart practical and project based vocational training for preparing youth for a career in research and entrepreneurship in fields of life sciences for self reliance.

Programme Specific Outcomes of M.Tech. (Energy and Environmental Management)

PSO1 To develop professional skills in students on conservation of energy, new energy resources and environmental management with the use of sustainable techniques.

PSO2 To provide knowledge on renewable and alternate energy resources.

PSO3 To provide knowledge on energy and environment system analysis.

PSO4 To create awareness on sustainable technologies in changing climatic scenarios.

PSO5 To educate students on tools, and modern techniques of energy efficiency and conservation.

PSO6 To provide job-oriented skills with training, seminar and projects.

KURUSKHETRA UNIVERSITY, KURUKSHETRA
INSTITUTE OF ENVIRONMENTAL STUDIES
SCHEME OF EXAMINATION FOR
M.Tech. Energy and Environmental Management (EEM)

FIRST SEMESTER

Paper Code	Title of Paper	Type of Paper	Hours/Week	Credits	Marks		
					Internal Assessment	Final Examination	Total
MEMT-101	Ecology and Systems Analysis	Core	4	4	40	60	100
MEMT-102	Energy Resources and Management	Core	4	4	40	60	100
MEMT-103	Energy and Climate Change	Core	4	4	40	60	100
MEMT-104	Research Techniques and Quantitative Methods	Core	4	4	40	60	100
MEMT-105	Practical - I	Core	8	4	40	60	100
MEMT-106	Practical - II	Core	8	4	40	60	100
Total				24	240	360	600

Note: Each Theory Final Examination will be of 3 hours and practical examination will be of 6 hours duration.

KURUSKHETRA UNIVERSITY, KURUKSHETRA
INSTITUTE OF ENVIRONMENTAL STUDIES
SCHEME OF EXAMINATION FOR
M.Tech. Energy and Environmental Management (EEM)

SECOND SEMESTER

Paper Code	Title of Paper	Type of Paper	Hours/Week	Credits	Marks		
					Internal Assessment	Final Examination	Total
MEMT-201	Environmental Assessment and Management	Core	4	4	40	60	100
MEMT-202	Renewable Energy and Technology	Core	4	4	40	60	100
MEMT-203	Environmental Remote Sensing & GIS	Core	4	4	40	60	100
MEMT-204	Environmental Biotechnology and Biofuels	Core	4	4	40	60	100
MEMT-205	Seminar	Core	1	1	25	-	25
MEMT-206	Practical - I	Core	8	4	40	60	100
MEMT-207	Practical - II	Core	8	4	40	60	100
Total				25	265	360	625

Note: Each Theory Final Examination will be of 3 hours and practical examination will be of 6 hours duration.

KURUSHKETRA UNIVERSITY, KURUKSHETRA
INSTITUTE OF ENVIRONMENTAL STUDIES
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M.Tech. Energy and Environmental Management (EEM)

THIRD SEMESTER

Paper Code	Title of Paper	Type of Paper	Hours/ Week	Credits	Marks		
					Internal Assessment	Final Examination	Total
MEMT-301	EL-1A (Energy Conservation and Efficient Systems)	Elective	4	4	40	60	100
	EL-1B (Environmental Bioremediation Technology)						
	EL-1C (Environmental Policies, Laws and Impact Assessment)						
MEMT-302	EL-2A (Industrial Energy)	Elective	4	4	40	60	100
	EL-2B (Energy from Waste)						
	EL-2C (Environmental Modelling)						
MEMT-303	Minor Project/Practical	Core	8	4	40	60	100
MEMT-304	Summer training (Report and Seminar)	Core	-	2	50	-	50
MEMT-305	Seminar	Core	1	1	25	-	25
MEMT-306	Practical	Elective	8	4	40	60	100
Total				19	235	240	475

Note: The minor project in the form of summer training (8 weeks) report with some Industry/NGO/Research Institute/ organization will be submitted by the student in the 3rd Semester and the student will give a presentation on the training.

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SCHEME OF EXAMINATION FOR
M.Tech. Energy and Environmental Management (EEM)

FOURTH SEMESTER

Paper Code	Title of Paper	Type of Paper	Credits	Marks		
				Internal Assessment	Final Examination	Total
MEMT-401	Dissertation	Core	10	-	250	250
MEMT-402	Seminar on Dissertation	Core	2	50	-	50
MEMT-403	Viva-voce on Dissertation	Core	2	-	50	50
MEMT-404	Progressive Seminar/ Laboratory Development Work	Core	2	50	-	50
Total			16	100	300	400

Note: M.Tech Dissertation will be evaluated by the Internal Supervisor/ Examiner and an External Examiner.

The Dissertation will be based on scientific data collection, analysis and fieldwork.

**ECOLOGY AND SYSTEMS ANALYSIS
MEMT-101**

Max. Marks: 60 + 40

Total Credits: 4

Time: 3 Hours

Objectives:

The aim of this course is to make students understand the basic concept of ecology, ecosystem, biological diversity, biomes and biogeochemical cycles, ecosystem disturbances, energy flow and population dynamics. The students will be able to apply concepts of ecology in better understanding of energy and environment and to understand different biotic interactions and ecological modelling.

Outcomes: On successful completion of the course, the students will be able to:

- CO1** Understand the concepts of ecology, population, community and ecosystems interactions.
- CO2** Gain knowledge about concept of sustainable development
- CO3** Explain the disturbances in natural environment and their mitigation measures
- CO4** Understand cycling of nutrients and energy flow (energy transfer and transformation) in ecosystem.
- CO5** Understand the concept, methodology and basic tools of environmental modeling
- CO6** Become aware of different modeling approaches, their scope, limitations and applications
- CO7** Gain knowledge about different analytical models and their applications in ecological studies

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Introduction : Aims and scope of ecology, biological levels of organization-genes to biosphere, Sustainable development, Ecological sustainability, Ecological footprint, Living planet Index, Human dimensions in ecology

Population ecology: Population and metapopulation, Population growth and regulation, Biotic interactions: Competition, mutualism, parasitism, predator-prey relations.

Unit-II

Community structure and organization: Nature of community and continuum, Ecological niche, Keystone species, Biological diversity, Ecosystem disturbance and succession. Biome and aquatic systems: Distribution, characteristics, climate and biota. Natural and anthropogenic disturbances, Invasive species: Ecology, impacts and control.

Unit-III

Ecosystem components, Ecosystem processes-photosynthesis and decomposition, Global C and N cycle, Man's impact on nutrient cycles. Energy in biological systems: Biological energy transformations, global distribution of primary productivity, human appropriation of productivity, energy flow models of terrestrial and aquatic systems.

Unit-IV

Concept of ecosystem modeling, Ecosystem stability, Cybernetics and ecosystem regulation. Systems theory, Ecological models: Compartment model, matrix model, statistical model, Mathematical model, Energy-Circuit Analog Model. Analytical models in Ecology: logistic model of population growth, Lotka-Volterra model, Models of succession.

Suggested Reading:

1. Begon, M., Harper, J.L. and Townsend, C.R. 1986. *Ecology: Individuals, Populations and Communities*. Blackwell, Oxford.
2. Chapin, F.S., Matson, P.A. and Mooney, H.A. 2002. *Principles of Terrestrial Ecosystem Ecology*. Springer-Verlag, New York.
3. Odum, E.P. 1983. *Basic Ecology*, Sanders, Philadelphia.
4. Singh K.P. and Singh J.S. 1992. *Tropical Ecosystems: Ecology and Management*. Wiley Eastern Limited, Lucknow, India.
5. Singh, J.S., Singh S.P. and Gupta S.R. 2015. *Ecology, Environmental Science and Conservation*, S.Chand Publishers, New Delhi.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz and sessional tests.

CO-PO MAPPING for MEMT 101

	PO1	PO2	PO3	PO4	PO5	PO6
C101.1	3	2	1	2	2	2
C101.2	2	2	2	2	3	3
C101.3	1	2	-	2	1	3
C101.4	2	3	1	2	2	2
C101.5	2	2	1	2	2	3
C101.6	2	2	2	2	2	2
C101.7	3	3	2	2	3	3
Average	2.14	2.29	1.5	2	2.14	2.57

CO-PSO MAPPING for MEMT 101

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C101.1	1	-	1	1	-	-
C101.2	2	2	2	3	2	1
C101.3	1	-	1	2	-	-
C101.4	-	-	1	-	-	-
C101.5	-	-	3	-	3	1
C101.6	-	1	2	-	3	2
C101.7	2	2	3	1	3	2
Average	1.5	1.7	1.86	1.75	2.75	1.5

ENERGY RESOURCES AND MANAGEMENT
MEMT- 102

Max. Marks: 60+40

Total Credits- 04

Time: 3 Hours

Objectives:

The course provides students an overview of the basic concepts of energy, non-renewable and renewable energy resources and different management strategies. The students will be able to learn the need of management of energy resources and promotion of use of appropriate management technology in harnessing energy resources.

Outcomes: On successful completion of this course, the students will be able to:

CO1 Explain the concepts of thermodynamics and earth's energy budget

CO2 Categorize various types of energy resources

CO3 Explain origin and development of fossil fuels and their impacts on environment

CO4 Describe present scenario of solar, wind, tidal, geothermal and bioenergy in India

CO5 Describe management of various energy sources

CO6 Understands OPEC market behaviour and new energy policies in India.

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Basic concepts of energy: Theoretical treatment of energy, Laws of thermodynamics, Carnot Efficiency, Energy quality. Energy balance of earth: Sunlight electromagnetic spectrum, Major flows in global hydrological cycle, Ocean-Currents and heat flux, Atmospheric circulation, Earth's energy budget

Unit-II

Energy resources: Non-renewable energy resources, Fossil fuels - origin and development of coal, types of coal and its reserves, coal - fired power plants - cleaner coal combustion - origin and reserves of petroleum and natural gas - composition and classification of petroleum - petroleum refining, Natural Gas origin, composition and storage. Environmental problems associated with petroleum.

Unit-III

Renewable energy resources: New developing renewable energy sources - nuclear fission reactors – fission and fusion power and the environment. Energy management and its present scenario in India- solar, wind, tidal, geothermal and bioenergy.

Unit-IV

Importance of management of energy sources, management of fossil fuel sources, oil crisis and economic development, OPEC Market behaviour, management of oil and natural gas-extraction and processing. New energy policies in India.

Suggested Readings:

1. Barrow, C. J. 2005. *Environmental Management and Development*. Taylor and Francis Group, London, New York.
2. Cleveland, C. J. 2008. *Encyclopedia of Energy*, Elsevier, New Delhi.
3. Kothari, D.P., Singal, K.C. and Ranjan, R. 2008. *Renewable energy sources and Emerging technologies*, Prentice hall, New Delhi.
4. Miller, G.T. 1997. *Environmental Science: Working With the Earth*, Wadsworth Publishing Company, Belmont, California.
6. Singh, J.S., Singh S.P. and Gupta S.R. 2015. *Ecology, Environmental Science and Conservation*, S.Chand Publishers, New Delhi.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz and sessional tests.

CO-PO MAPPING for MEMT 102

	PO1	PO2	PO3	PO4	PO5	PO6
C102.1	2	2	-	2	1	1
C102.2	1	1	-	2	-	2
C102.3	2	2	-	2	-	1
C102.4	1	-	-	3	-	3
C102.5	-	-	-	3	2	3
C102.6	-	-	-	2	-	3
Average	1.5	1.67	-	2.33	1.5	2.17

CO-PSO MAPPING for MEMT 102

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C102.1	1	-	2	-	2	-
C102.2	2	3	1	2	1	-
C102.3	1	-	1	2	1	-
C102.4	3	3	2	3	2	3
C102.5	2	2	1	2	2	2
C102.6	1	-	2	2	-	1
Average	1.7	2.7	1.5	2.2	1.6	2.0

ENERGY AND CLIMATE CHANGE
MEMT-103

Max. Marks: 60+40

Total Credits- 04

Time: 3 Hours

Objectives: The aim of this course is to provide the knowledge of impacts of use of different energy resources on environment, recent energy scenarios, global climate change, its impacts and mitigation strategies. The students will be able to understand the trends in energy related carbon emissions, carbon trading and climate change mitigation measures.

Outcomes: On successful completion of this course, the students will be able to:

CO1: Learn about similarities and differences across the fields of climate, energy and environment with a focus on climate change.

CO2: Understand, analyse and compare the trends of carbon emission at national and international levels.

CO3: Determine the production of green house gases based on energy consumption patterns.

CO4: Identify impacts of climate change on human societies and natural ecosystems.

CO5: Describe the main processes involved in climate change and climate modelling.

CO6: Describe the ethical, scientific, and policy strengths and weaknesses of current and proposed mitigation and adaptation strategies.

CO7: Understand main aspects on climate regulation with focus on its impact on the energy sector.

CO8: Understand the possibilities for sustainable development in terms of future energy use.

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit.

The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Energy and carbon emissions, World energy use and current energy scenario, Trends in energy use of oil, coal and gas, Energy use and air quality, Nuclear energy and environment, Fission and fusion, Clean Technology: Environmental Life Cycle Assessment.

Unit-II

Global climate change: Greenhouse effect, greenhouse gases: sources, trends, radiative forcing, warming potential of gases.

Photosynthetic mechanism and global climate change, Impacts of global warming: Polar ice caps and melting of glaciers, sea level increase, weather extreme, ecosystems, human health, coral reef bleaching, surface ocean chemistry, Biogenic calcification in oceans.

Unit-III

Tools to study climate change: Climate change modelling and general circulation models. Mitigation strategies for global warming; Biological Carbon Sequestration, Carbon Sequestration in geological formations, role of forests and dry lands in Carbon Sequestration, carbon capture and storage technologies. Geoengineering

Kyoto protocol, CDM and carbon trading.

Unit-IV

CO₂ challenge: Contribution by source; contribution by national and international sector; Carbon intensity and emission scenarios; Global warming as an energy problem; Energy efficiency; Energy transition and carbon content reduction; impact of climate change on energy demand; environmental impacts of energy consumption. Sustainable low carbon future; role of IPCC .

Suggested Reading:

1. Cleveland, C. J. 2008. *Encyclopedia of Energy*, Elsevier, New Delhi.
2. Goudie, A. S. and Cuff, D. J. 2002. *Encyclopedia of global change*, Oxford, New York.
3. IPCC (Intergovernmental Panel on Climate Change) 1990. *Climate Change: The IPCC Assessment*. Cambridge University Press, Cambridge.
4. Sorokhtin, O.G., Chilingar, G.V. and Khilyuk, L.F. 2007. *Global warming and global cooling: Evolution of climate and earth*, Elsevier, Netherland.
5. Fouquet R. 2015, *Handbook on Energy and Climate Change*, Edward Elgar Publishing, UK.
6. Cherian A. 2015, *Energy and Global Climate Change: Bridging the Sustainable Development Divide*, Wiley Publisher, New York.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz and session tests.

CO-PO MAPPING for MEMT 103

	PO1	PO2	PO3	PO4	PO5	PO6
C103.1	3	1	1	2	2	2
C103.2	3	1	-	3	-	3
C103.3	2	-	-	2	2	3
C103.4	3	2	2	3	2	3
C103.5	3	2	-	3	1	3
C103.6	1	-	3	2	2	2
C103.7	2	1	-	3	-	2
C103.8	1	2	1	3	-	2
Average	2.25	1.5	1.75	2.63	1.8	2.5

CO-PSO MAPPING for MEMT 103

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C103.1	2	1	2	1	1	1
C103.2	2	-	2	1	-	1
C103.3	2	1	3	1	-	2
C103.4	1	-	1	1	-	3
C103.5	2	-	2	-	2	3
C103.6	3	2	1	2	2	2
C103.7	2	2	2	3	1	1
C103.8	3	2	2	3	2	1
Average	2.13	1.6	1.88	1.71	1.6	1.75

RESEARCH TECHNIQUES AND QUANTITATIVE METHODS
MEMT-104

Max. Marks: 60+40

Total Credits: 04

Time: 3 Hours

Objectives:

The course provides the students knowledge on principles of spectroscopic and chromatographic techniques and their applications in environmental analysis; knowledge on different statistical techniques, sampling and analytical methods for environmental components. The students will acquire skills in handling of instruments, statistical tools, techniques and models.

Outcomes: On successful completion of this course, the students will be:

- CO1** Able to understand the principles and handling of different analytical instruments and techniques used in the environmental (air, water and soil) analysis, and define the terms associated with the instrumentation.
- CO2** Able to understand the applications and limitations of widely used instrumentation of spectroscopy, chromatography and microscopy.
- CO3** Trained on the theory and practice of descriptive and inferential statistical tools and techniques to analyze environmental data and deriving meaningful conclusions.
- CO4** Capable to understand the basics and types of experimental design for data collection under different environmental conditions.
- CO5** Equipped with different methods used in the sampling of air, water and soil.
- CO6** Able to learn about methods to assess ecological status of a site by measuring plant biomass and productivity, and soil microbial diversity, soil enzymes and soil carbon.

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks

Unit - I

Principles and applications of spectroscopy: UV-Vis, Spectrophotometry, Flame Photometry, Atomic Absorption Spectrophotometry (AAS), Colorimetry, Fluorometry, Inductively Coupled Plasma – Atomic Emission Spectroscopy (ICP – AES), Inductively Coupled Plasma – Mass Spectroscopy (ICP – MS).

Unit - II

Chromatography: Principles and applications of chromatographic techniques: (a) Paper (b) Thin Layer Chromatography (TLC)(c) Column (d) Gel (e) Gas Chromatography (GC) and (f) High Performance/Pressure Liquid Chromatography (HPLC) Microscopy: Optical, Phase Contrast, Automation method of analysis. Vocational prospects of instrumentation.

Unit - III

Types of data and measurement level; Statistical applications in environmental data analysis, , Measures of Central Location and Dispersion, Probability, Correlation, Significance Test for Correlation, Regression, Standard error of estimate, Null hypothesis and Error Types, Statistical significance, t-test - test of difference between means of two populations Chi-square

test; Analysis of variance (ANOVA).

Unit - IV

Principles of experimental design randomization, replication and local control, Types of experimental design- CRD, RBD, LSD, Simple factorial design; Analysis of experimental designs. Sampling methods for water, air and soil analysis; Methods of vegetation analysis, Methods of estimating plant biomass and productivity, Methods of Soil Analysis - soil microbial diversity, soil enzymes and soil carbon. Vocational opportunities of statistical techniques/models.

Suggested Readings:

1. Gomez, K.A. and Gomes, A.A. 1984. Statistical Procedures for Agricultural Research, John Wiley and Sons, New York.
2. Hoshmand, A.R. 1998. Statistical Methods for Environmental and Agricultural Sciences, CRP Press, New York.
3. John, W. & Mark, M. (eds). 2004. Environmental Modeling: Finding Simplicity in Complexity, John Wiley and Sons Inc., New York.
4. Zhang, C. 2007. Fundamentals of Environmental Sampling and Analysis, John Wiley and Sons, New Jersey.
5. Hobart H. Willard, Lynne L. Merritt Jr., John A. Dean, Frank A. Settle Jr. 1988, Instrumental Methods of Analysis (Chemistry), Wadsworth Publishing Company, California.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz and sessional tests.

CO-PO MAPPING for MEMT 104

	PO1	PO2	PO3	PO4	PO5	PO6
C104.1	3	3	2	1	-	3
C104.2	3	3	2	2	-	3
C104.3	3	3	2	3	-	3
C104.4	2	1	2	1	-	2
C104.5	2	3	1	3	-	3
C104.6	2	2	1	2	2	3
Average	2.5	2.5	1.67	2	2	2.83

CO-PSO MAPPING for MEMT 104

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C104.1	2	2	3	1	2	3
C104.2	1	-	2	-	-	2
C104.3	1	2	3	2	2	3
C104.4	1	1	2	-	-	2
C104.5	2	-	2	2	1	3
C104.6	2	1	1	1	1	2
Average	1.5	1.5	2.17	1.5	1.5	2.5

**ENVIRONMENTAL ASSESSMENT AND MANAGEMENT
MENT-201**

Max. Marks: 60+40

Total Credits: 04

Time: 3 Hours

Objectives:

The aim of this course is to impart knowledge on Environmental Impact Assessment process and methodology, impacts of different industries on environment, environmental Auditing and role of judiciary in environmental protection in Indian context. The students will be able to identify impacts of different industries on environment and understand Environmental Management systems (EMS) and strategies of sustainable development.

Outcomes: On successful completion of this course, the students will be able to:

- CO1.** Develop foundation on the concept and process of environmental impact assessment (EIA).
- CO2.** Equip with various methods used in the prediction and analyses of data for the environmental impact assessment.
- CO3.** Explain the role and importance of environmental management systems for a project or an activity.
- CO4.** Use the concept of sustainability in different areas of a project.
- CO5.** Practice EIA that examines the environmental consequences of development actions, in advance.
- CO6.** Carry out energy and environmental auditing of the industries.

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

UNIT-I

Approaches, objectives, principles and frameworks. Purposes and aims of environmental impact assessment, EIA methodology, EIA processes: Project screening, scoping, base-line data, impact identification: prediction, evaluation, valuation of environmental impacts, mitigation, public participation, presentation, review and decision making, monitoring and auditing.

UNIT -II

Environmental Management Plan, Environmental components of EIA. Environmental procedures in India; Impact, identification and methods, Case studies of EIA of hydroelectric dam and river valley project, Thermal power plants and petroleum exploration,; Types of environmental audits ; Environmental audit and EIA. National Environmental Policy - 2006, EIA notifications.

UNIT-III

Energy audits-energy conservations; Provision of energy conservation Act, 2001, List of energy Intensive industries and other establishments, Physical and operational data for the facility, Energy audit procedure, safety considerations, safety checklist, conducting the audit visit in industries. Primary identification of energy conservation opportunities: Post-audit

analysis, energy audit report, energy audit report format, energy action plan. Institutional designs for renewable energy resources.

UNIT-IV

Environmental management systems in India, ISO-14001. Environmental sustainability - dimension and sustainability models. Environmental sustainability indicators, sustainability index, strategies for sustainable development, Traditional knowledge systems for sustainable development. Introduction to environmental law and environmental protection act in India. Role of Judiciary in environmental conservation in India. Vocational prospects of EIA and EMS.

Suggested Readings:

1. Canter, L.W. 1996. Environmental Impact Assessment. 2nd edition, McGraw–Hill, New York.
2. Glasson, J., Therivel R. and Chadwick A. 1994. Introduction to Environmental Impact Assessment. UCL Press. London.
3. Morgan, R.K. 2002. Environmental Impact Assessment: A Methodological Perspective, Kluwer Academic Publishers, London.
4. Morris, P. and Thesivel, R. (Eds.) 2001. Methods in Environmental Impact Assessment. UCL Press, London.
5. Treweek, J. 1999. Ecological Impact Assessment. Blackwell Science, UK.
6. Christopher S. and Mark Y. 2002. Installing Environmental Management Systems. EarthScan London.
7. Barrow, C. J. 2005. Environmental Management and Development, Taylor and Francis Group, London and New York.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MEMT 201

	PO1	PO2	PO3	PO4	PO5	PO6
C201.1	3	-	-	2	1	2
C201.2	3	-	2	3	-	3
C201.3	2	-	-	2	-	3
C201.4	2	2	1	2	2	2
C201.5	2	1	-	3	-	3
C201.6	3	-	-	2	-	3
Average	2.5	1.5	1.5	2.3	1.5	2.7

CO-PSO MAPPING for MEMT 201

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C201.1	2	-	2	-	-	3
C201.2	2	1	3	1	-	3
C201.3	3	1	3	2	-	2
C201.4	2	2	1	2	2	2
C201.5	2	-	2	2	2	3
C201.6	3	2	3	1	3	3
Average	2.3	1.5	2.3	1.6	2.3	2.7

RENEWABLE ENERGY AND TECHNOLOGY
MEMT-202

Max. Marks: 60 + 40

Total Credits: 4

Time: 3 Hours

Objectives: The aim of this course is to provide the details regarding solar energy, solar photovoltaic conversion, design and analysis of PV cells, and other energy options i.e. wind, nuclear, tidal, geo-thermal, wave and tar and oil shale, biomass energy, biogas, biodiesel and hydrogen. The students will be able to understand energy options and techniques of harnessing and methods of generating energy from organic wastes.

Outcomes: On successful completion of this course, the students will be able to:

- CO1 Describe various energy alternatives like tar sands and oil shale, tidal energy, wave energy, ocean thermal energy and biomass energy.
- CO2 Understand renewable energy types, energy storage and energy conversion systems.
- CO3 Explain working, construction and design of energy collectors, absorbers and energy concentrators.
- CO4 Design and analyze photovoltaic conversion like PV cells and solar power heaters.
- CO5 Understand the concepts of wind energy systems, conversion to wind flow, and wind energy converters.
- CO6 Apply the concepts of thermo and bio-chemical process along with newer technologies of biomass conversion to bio-fuels.

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Energy alternatives, the solar option, the nuclear option, tar sands and oil shale, tidal energy, geo-thermal energy. Solar energy: Solar radiations, solar thermal conversion devices and storage, applications. Solar photovoltaic conversion, Wave energy and Ocean thermal energy conversion, Hydroelectric energy. Vocational prospects of renewable and alternate energy sector.

Unit-II

Indirect and direct solar energy conversion. Photovoltaic conversion: Optical effect of p-n junction, design and analysis of PV cell, PV cell fabrication, system design, Solar power heaters. Wind energy: Conversion to wind flow, wind energy converters, commercial wind power development, wind energy storage and transfer.

Unit-III

Solar energy collection and storage, Solar energy for industrial process heat. Industrial process heat- temperature requirement, consumption pattern. Designing thermal storage, transport of energy, concentrating solar collector system, industrial applications of concentrating collector. Designs of energy collectors, tracking systems, absorbers and energy concentrators.

Unit-IV

Biomass energy: Sources of biomass energy, Petroleum plants, Energy plantations, Production of biogas from organic wastes, biogas plant designing. Recent trends in biodiesel production. Bio- ethanol production: Lessons from national and international experience. Energy from organic wastes; recent techniques in bio gas, biodiesel, bio-ethanol, bio-hydrogen fuel.

Suggested Reading:

1. Chaudhuri, S. P. G. 2007. *Renewable Energy in the Sundarbans*, TERI.
2. Holechek, J.L., Cole, R. A., and Fisher, V. 2000. *Natural resources*, Prentice Hall, New Jersey, USA.
3. Kothari, D.P., Singal, K.C. and Ranjan, R. 2008. *Renewable energy sources and emerging technologies*, Prentice hall, New Delhi.
4. Podobnik, B. 2006. *Global energy shifts*. TERI press.
5. Sorensen, B. 2006. *Renewable energy*, Elsevier Publication, New Delhi.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MEMT 202

	PO1	PO2	PO3	PO4	PO5	PO6
C202.1	3	-	-	2	1	2
C202.2	3	-	1	2	1	2
C202.3	2	-	-	3	-	3
C202.4	1	-	-	3	2	3
C202.5	-	-	-	2	-	2
C202.6	3	-	2	3	2	3
Average	2.4	-	1.5	2.5	1.5	2.5

CO-PSO MAPPING for MEMT 202

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C202.1	2	3	2	1	1	2
C202.2	3	3	1	2	3	2
C202.3	2	2	2	3	2	3
C202.4	2	2	2	2	2	3
C202.5	2	2	2	1	2	2
C202.6	3	2	1	3	2	2
Average	2.3	2.3	1.7	2	2	2.3

ENVIRONMENTAL REMOTE SENSING AND GIS

MEMT- 203

Max. Marks: 60+40

Total Credits: 04

Time: 3 Hours

Objectives:

The course provides students with an introduction to the principles and techniques of remote sensing and geographic information systems (GIS) and the application of these techniques to the various aspects of environment including the earth observation and analysis. The students will be able to understand the information embedded in remotely sensed data, its retrieval and geospatial analysis.

Outcomes: On completion of this course, the students will have:

- CO1.** A base for understanding Remote Sensing (RS) and Geographic Information System (GIS) as an IT tool, its purpose and utility for the mankind in general and in geospatial study of environmental components, specifically.
- CO2.** An understanding of types, process, platforms and sensors used in RS with an emphasis on optical and microwave remote sensing.
- CO3.** An understating about the elements and techniques of image interpretation of different scales and resolution, concepts and techniques of digital image processing, photogrammetry and aerial photography.
- CO4.** Profound knowledge about ground verification techniques, spatial and non-spatial data types and sources of different domains and its integration and analysis in a GIS environment, and problem-based designing and management of GIS projects.
- CO5.** Basic competency in skills with functional knowledge to carry out RS and GIS based projects, and usage of GPS.
- CO6.** Familiarization about the scope of RS and GIS technology in the field of environment and energy management.

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Principle, basics and components of Remote Sensing, Electromagnetic spectrum, Atmospheric windows, scattering, Spectral reflectance and emission, Energy-matter interaction. Basic principles of global positioning system.

Unit – II

Remote Sensing - processes, platforms, scanners and sensors; Systems for data collection - passive and active remote sensing; Multispectral Remote Sensing; Concepts and applications of Microwave and LiDAR Remote sensing.

Unit-III

Elements of visual image interpretation, Digital image processing, Image Classifications, Ground truthing, Geo-referencing. Photogrammetry: Basic concepts, Types of aerial photographs. Application of Remote Sensing in Energy, Natural resource management, Disaster management, Urban planning, Coastal zone management etc.

Unit-IV

GIS- basic concept. raster and vector data; Analytical modeling in GIS. GIS project management - problem specific design, implementation and evaluation. GIS application in Natural resource management, Biodiversity, EIA, Solid waste management, Disaster management etc. Vocational prospects of remote sensing and GIS.

Suggested Readings:

1. James B. Campbell and Randolph H. *Introduction to remote sensing*, Wynne, Guilford Press (5th ed., 2011), New York.
2. Thomas M. Lillesand, Ralph W. Kiefer, Jonathan W. Chipman. *Remote Sensing And Image Interpretation*, 7th Ed., 2015, John Wiley & Sons, USA.
3. An Introduction to Geographical Information Systems, Heywood Ian, Pearson Education India, 2010, New Delhi.
4. Harvey F.A *Primer of GIS: Fundamental Geographic and Cartographic Concepts*, TheRawat Publication; 2009 edition (2009).

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MEMT 203

	PO1	PO2	PO3	PO4	PO5	PO6
C203.1	-	2	-	2	-	2
C203.2	-	2	-	2	-	3
C203.3	-	1	-	2	-	3
C203.4	-	-	-	2	-	3
C203.5	-	2	-	3	2	3
C203.6	-	2	-	3	2	3
Average	-	1.8	-	2.3	2	2.8

CO-PSO MAPPING for MEMT 203

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C203.1	2	1	2	3	1	3
C203.2	2	-	1	2	1	3
C203.3	2	-	2	2	-	3
C203.4	2	-	2	2	-	3
C203.5	3	2	3	3	2	3
C203.6	3	2	3	3	3	3
Average	2.3	1.7	2.2	2.5	1.8	3

ENVIRONMENTAL BIOTECHNOLOGY AND BIOFUELS
MEMT-204

Max. Marks: 60+40

Total Credits: 04

Time: 3 Hours

Objectives:

The proposed course is designed to teach students, the microbiological and biotechnological principles of treatment technologies for clean-up of contaminated environments and to recover the valuable resources for the welfare of human society. The students will be able to understand the applications of environmental biotechnology in the different areas of bioremediation, biofuel production and biorefineries.

Outcomes: On completion of this course, the students will be able to:

CO1: Understand the applications of environmental biotechnology in different areas of bioremediation.

CO2: Understand the concept and application of biosensors to assess the pollutants in environment.

CO3: Demonstrate the understanding of biotechnological tools used in forest management and biodiversity conservation.

CO4: Understand the concept of biological treatment for wastewater.

CO5: Demonstrate the basics of GMOs, biosafety guidelines and IPR.

CO6: Understand the concept of biofuel production and biorefineries.

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Microbes and environmental management. Biodegradation of macromolecules and xenobiotics, Bioremediation techniques: aerobic and anaerobic, Bioremediation of metal contaminated sites and spilled oil, Biosorption, Bioaccumulation, Bioleaching and Biomining for recovery of resources, Phytotechnology.

Unit-II

Biosensors in detection of Environmental Pollution – BOD sensor, Methane biosensor, Ammonia and nitrate biosensor. Bioreactors designs, types and environmental applications. Micropropagation and cloning of plants – application in forestry; Biotechnology in preservation of bio-diversity; Cryopreservation and Gene banks.

Unit-III

Wastewater treatment technologies; Biological Processing of waste water, Biotechnology for solid, hazardous and radioactive waste management, Biodegradable plastics. Biotechnology for wasteland management; Biofertilizers and Biopesticides and IPM. GMO's, Biosafety and Bioethics guidelines. IPR and environment. Vocational prospects of environmental biotechnology.

Unit-IV

Biofuels: Biodiesel fuels, their origin, chemical and physical properties; Biodiesel production; Advantages and disadvantages of biodiesel; Storage and use of biodiesel; Bioethanol production, properties and its limitations. Biorefinery concept – biomass derived chemical products. Biomass gasification; Policy issues in biofuels, Indian Biofuel Programme.

Suggested Readings:

1. Armstrong, F. and Blundell, B. K. 2007. *Energy.....beyond oil*, Oxford, New York.
2. Bhojvaid, P.P. 2007. *Biofuels Towards a Greener and Secure Energy Future* TERI Press, New Delhi.
3. Buchanan, G. and Jones 2004. *Biochemistry and Molecular Biology of Plants*, IK International Pvt. Ltd., New Delhi.
4. Kaushik, N. 2004. *Biopesticides for Sustainable Agriculture, Prospects and Constraints* TERI Press, New Delhi.
5. Nelson, G.C. 2001. *Genetically Modified Organisms in Agriculture: Economics and Politics*. Academic Press.
6. Spiros, N.A. and Reineke, W. 2002. *Biotechnology for the Environment: Soil Remediation*, Kluwer Academic Publishers, Springer-Verlag, New York.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MEMT 204

	PO1	PO2	PO3	PO4	PO5	PO6
C204.1	3	-	-	2	3	3
C204.2	3	-	-	2	3	3
C204.3	3	2	2	2	3	3
C204.4	2	1	2	3	2	2
C204.5	2	-	3	2	2	3
C204.6	3	-	2	3	2	2
Average	2.7	1.5	2.3	2.3	2.5	2.7

CO-PSO MAPPING for MEMT 204

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C204.1	2	3	2	2	2	3
C204.2	2	2	2	2	1	3
C204.3	2	2	2	2	-	3
C204.4	2	-	1	-	1	3
C204.5	1	-	1	1	-	3
C204.6	3	3	2	3	3	3
Average	2	2.5	1.7	2	1.8	3

ENERGY CONSERVATION AND EFFICIENT SYSTEMS
MEMT- 301 (EL-1A)

Max.Marks: 60+40

Total Credits: 04

Time: 3 Hours

Objectives:

The course provides the students, knowledge on principles and practices of energy conservation, renewable energy systems and efficiency of various energy related processes. The students will be able to learn about global/local energy issues, opportunity and techniques of saving energy, energy auditing for applications in industries and research.

Outcomes: On completion of this course, the students will have:

- CO1** Knowledge on fundamentals of conservation of energy, energy conservation programmes and different energy scenarios.
- CO2** Knowledge on technologies of energy conservation and sustainable energy.
- CO3** Awareness on the basics of energy efficiency, methodologies to improve energy efficiency and its effects.
- CO4** Understanding on the concepts of energy efficient buildings and utilities such as pumps, motors, fans windows, lighting, compressed air systems, refrigeration and air conditioning system.
- CO5** Knowledge about different renewable energy systems such as solar thermal and solar photovoltaic, wind, ocean wave and tidal, geothermal, biomass, nuclear and their applications.
- CO6** Familiarization with Bureau of Energy Efficiency (BEE) and star rating concept.

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit –I

Conservation of energy: overview, concept and principle of energy conservation, Laws of Thermodynamics, Energy conservation as preservation of resources, Conservation measures for energy, Energy scenario: energy pricing in India, energy sector reforms, managing an effective energy conservation programme, Material and energy balance.

Unit-II

Energy efficiency: introduction, definition and importance, benefits of energy efficiency, potential for energy efficiency, industrial energy efficiency, The effect of efficiency improvement on primary energy demand, Energy distribution, generation and Demand Side Management (DSM). Energy analysis of buildings.

Unit-III

Sustainable energy technologies and energy efficiency, Energy intensity, Pathways to improve energy intensity. Cogeneration: concept, options (steam/gas, turbine, diesel engine based). Reduction of energy loss and energy recovery in urban ecosystems. Energy efficiency in buildings (green building), solar water heating system.

Unit-IV

Wave tidal power technologies. geothermal, nuclear, alternative transport fuels, Energy efficient vehicles technologies - Advance ICE, Hybrid electric, Plug-in hybrid, Flex-fuel, Fuel Cell technology, energy efficient motors, windows, lighting. Energy efficient pumps, fans, compressed air systems, refrigeration and air conditioning systems. Waste heat recovery. Bureau of energy efficiency, Concept of Star rating.

Suggested Reading:

1. Cleveland, Cutler J. 2008. *Encyclopedia of Energy*, Elsevier, New Delhi.
2. Kothari. D.P., Singal, K.C. and Ranjan, R. 2008. *Renewable Energy Sources and Emerging Technologies*, Prentice hall, New Delhi.
3. Kreithand F., Goswami D.Y., *Handbook of Energy Efficiency and Renewable Energy*, C.R.C. Press.
4. Kreith. F., Goswami. D.Y.2007. *Handbook of Energy Efficiency and Renewable Energy*, Taylor & Francis Group, LLC
5. Owen, Oliver S. and Chiras, Daniel D. (1990). *Natural Resource Conservation-An Ecological Approach* Macmillon, New York.
6. Wiley J.S., Turner W.C., *Energy Management Handbook*.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MEMT 301-EL-1A

	PO1	PO2	PO3	PO4	PO5	PO6
C301EL1A.1	-	1	-	2	-	2
C301EL1A.2	-	-	-	3	2	2
C301EL1A.3	-	-	2	3	2	3
C301EL1A.4	-	-	-	3	-	3
C301EL1A.5	-	2	1	3	1	3
C301EL1A.6	-	-	-	1	-	2
Average	-	1.5	1.5	2.5	1.7	2.5

CO-PSO MAPPING for MEMT 301-EL-1A

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C301EL1A.1	3	2	1	2	1	-
C301EL1A.2	3	3	2	3	2	2
C301EL1A.3	2	3	-	3	3	3
C301EL1A.4	2	1	-	2	2	2
C301EL1A.5	2	3	2	2	3	2
C301EL1A.6	1	-	2	-	2	1
Average	2.2	2.4	1.8	2.4	2.2	2

Environmental Bioremediation Technology
MEMT-301 (EL-1B)

Max. Marks: 60 + 40

Total Credits-04

Time: 3 Hours

Objectives:

The aim of this course is to make students understand biotransformation, biodegradation of xenobiotics, bioremediation strategies and their applications for cleanup of environmental contaminants. The students will be able to understand the various applications of bioremediation technologies and the kinetics and modelling of biodegradation.

Outcomes: On completion of this course, the students will be able to:

CO1: Understand the characteristics and bioremediation of xenobiotic compounds.

CO2: Develop skills to apply the different bioremediation techniques for the degradation of toxic contaminants.

CO3: Understand the process of phytoremediation and role of algae and fungi in bioremediation.

CO4: Understand the application of genetic engineering in phytoremediation.

CO5: Understand the bioremediation processes for gaseous pollutants, role and applications of biosensors in remediation technologies

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Introduction to bioremediation, Historical development of environmental bioremediation, Requirements for bioremediation, Constraints and priorities of bioremediation, Applications of bioremediation technologies. Xenobiotic compounds, their structure and persistence in environment, Oil spills, Oil products in environment. Biodegradation- principles and microbiology; Microconversions of xenobiotics

Unit-II

Biotransformation of pesticides and hydrocarbons, Biodegradation kinetics, Bioavailability, Biomineralization, Testing for biodegradability, Numerical modelling of biodegradation. Biological processing of waste water, Bioreactors – designs used for treatment of sludge and removal of metals from waste water. Biodegradable plastic, Biodegradation of PAH in environment.

Unit-III

Bioremediation strategies – biostimulation and bioaugmentation, Bioremediation techniques *in-situ* and *ex-situ*. Bioremediation of organic and metal contaminated environments. Metal toxicity and bioavailability. Biosorption and precipitation. Bioremediation technologies for heavy metal and radionuclides removal. Phytoremediation and its processes, role of phytochelators. Applications of genetic engineering in phytoremediation. Algal and fungal based bioremediation.

Unit-IV

Gaseous bioremediation, biofilms, bioscrubbers, bioventing, Soil Vapour Extraction (SVE), Water recirculation systems, Air sparging, Biobarriers, Composting, Phytoremediation for air technologies. Role of biosensors in bioremediation technologies, Biofilms and their applications.

Suggested Reading:

1. Scragg A., 2008. *Environmental Biotechnology*, Oxford University Press. New York
2. Singh S.N., Tripathi R.D., 2007. *Environmental Bioremediation Technologies*, Springer, New York.
3. Mohapatra P.K. 2007. *Textbook of Environmental Biotechnology*, I.K. Publishing House, New Delhi.
4. Olguin E.J., Sanchez G., Hernandez E. 2005. *Environmental Biotechnology and Cleaner Processes*, Replika Press, Kundli.
5. Trivedi P.C. 2008. *Pollution and Bioremediation*, Sheetal Printer, Jaipur, India.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MEMT 301-EL-1B

	PO1	PO2	PO3	PO4	PO5	PO6
C301EL1B.1	2	2	1	1	2	2
C301EL1B.2	3	3	3	3	2	3
C301EL1B.3	3	3	1	2	3	3
C301EL1B.4	3	3	1	2	3	3
C301EL1B.5	3	2	2	2	2	3
Average	2.8	2.6	1.6	2.0	2.4	2.8

CO-PSO MAPPING for MEMT 301-EL-1B

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C301EL1B.1	2	-	-	1	2	2
C301EL1B.2	3	2	2	2	3	3
C301EL1B.3	2	2	3	2	1	2
C301EL1B.4	2	1	2	3	1	2
C301EL1B.5	2	1	3	3	1	2
Average	2.2	1.5	2.5	2.2	1.6	2.2

ENVIRONMENTAL POLICIES, LAW AND IMPACT ASSESSMENT
MEMT- 301 (EL - 1C)

Max.Marks: 60+40

Total Credits: 04

Time: 3 Hours

Objectives:

The aim of the course is to make the students understand the environmental policies and planning, environment impact assessment and environment clearance process. The course will enable students to apply the knowledge of EIA and environment clearance for systematic assessment of industrial and infrastructural projects.

Outcomes: A student after taking up this course would be able

CO1: To acquire values and attitude towards understanding various environmental policies and constitutional framework governing environment in India.

CO2: To learn and apply various environmental legislations/acts in India.

CO3: To understand the emerging environmental issues and key international treaties for environment protection.

CO4: To clarify the concepts of EIA and develop the professional skills necessary to enable them to undertake environment impact assessment

CO5: Learn through a variety of professional tools used in predicting environmental impacts.

CO6: Experience their own perspective through various case-studies on impact assessment and developing critical thinking for shaping strategies for environmental management planning, environment auditing and risk assessment

CO8: To understand the recent trends in energy investment, pricing and energy utilisation through various policies and modelling.

CO9: To understand the energy conservation strategies and role of BEE (Bureau of Energy Efficiency) in conservation.

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit –I

National and International environmental issues, International Conventions and Agreements on environmental issues: UNFCCC, Stockholm Conference, The Rio Earth Summit 2012 (Rio +20), Convention on Climate Change, Agenda 21, Kyoto Protocol, Montreal Protocol, Convention on Biological diversity, Ramsar Convention on Wetlands, The Environmental (Protection) Act1986, The Biological Diversity Act, 2002,Wild Life (Protection) Act, 1972.

Unit- II

Approaches, objectives, principles and frameworks of: Air (Prevention & control of pollution)Act, 1981, Motor Vehicle Act, 1988, The water (Prevention & control) Pollution Act, 1974,Solid wastes (Management and Handling) Rules, 2000, Coastal Regulation Zone Notification1991, Disaster Management Act, 2005. CPCB,BIS and APHA standards for air, water and soil; Scheme of labelling of Environment friendly product (Eco mark).

Unit – III

Energy policies in the country; Tariffs and subsidies; Energy utility interface; National Energy Plan, Energy Investment Planning & Energy pricing, Concept of Energy & Environment Management System (EEMS), Role of modelling in energy policy analysis, Role of BEE(Bureau of Energy Efficiency) in energy conservation.

Unit –IV

Environmental Impact Assessment, EIA guidelines of Ministry of Environment, Forest and Climate Change (MoEF&CC), Strategic Environmental Assessment and Cumulative Effects Assessment, Preparation of ISO Manuals for Industry; Integrating ISO 9000, ISO 14001 and OHSAS 18001, GRIHA(Green Rating for Integrated Habitat Assessment) - Guidelines. Case studies: EIA for Metro Stations, IT Parks, Nuclear Power Plant and Infrastructure.

Suggested Reading:

1. Kathryn L. Schroder 2008 *Environmental Law* Thomson Delmar learning, New York.
2. Karen E. Makuch, Richard Pereira 2012. *Environmental & Energy Law* Wiley-Blackwell, UK.
3. MEA 2005. *Ecosystems and Human Well-being: health synthesis, a report of the WorldResources Institute*, Washington, D.C.
4. Singh, J.S., Singh S.P. and Gupta S.R. 2015. *Ecology, Environmental Science and Conservation*, S.Chand Publishers, New Delhi.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MEMT 301-EL-1C

	PO1	PO2	PO3	PO4	PO5	PO6
C301EL1C.1	1	-	2	1	-	2
C301EL1C.2	-	-	2	2	-	2
C301EL1C.3	1	2	-	3	2	3
C301EL1C.4	-	-	2	3	2	3
C301EL1C.5	-	2	2	1	2	3
C301EL1C.6	2	2	2	3	2	3
C301EL1C.7	-	-	-	3	2	3
C301EL1C.8	2	-	1	2	1	3
Average	1.5	2	1.8	2.3	1.8	2.8

CO-PSO MAPPING for MEMT 301-EL-1C

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C301EL1C.1	1	-	1	-	-	1
C301EL1C.2	2	-	-	-	-	2
C301EL1C.3	2	1	1	2	-	2
C301EL1C.4	2	-	2	1	1	3
C301EL1C.5	1	-	2	2	-	2
C301EL1C.6	2	1	2	1	1	2
C301EL1C.7	2	2	2	2	2	3
C301EL1C.8	2	2	2	2	2	2
Average	1.75	1.5	1.71	1.67	1.5	2.13

**INDUSTRIAL ENERGY
MEMT-302 (EL - 2A)**

Max. Marks: 60 + 40

Total Credits- 4

Time: 3 Hours

Objectives:

The aim of this course is to enable the students to understand different aspects of energy conservation and recovery systems in industries. The students will be able to understand energy efficiency practices and technologies that can be applied at the component, process, facility, and organizational levels.

Outcomes: On successful completion of this course, the students will be able to:

- CO1** Understand energy conservation potential in various industries
- CO2** Have a basic knowledge of energy storage systems and industrial safety measures
- CO3** Identify energy savings opportunities in thermal and electrical systems
- CO4** Apply the knowledge in waste heat recovery and heat exchanger networking
- CO5** Understand hydrogen fuel technology
- CO6** Apply the knowledge of energy saving measures in different energy intensive process industries

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Types of energy; Energy conversion steps; Energy use in industrial operations; Energy conservation potential in various industries and commercial establishments - Energy intensive industries - an overview; End use energy efficiency. Energy Storage Systems - storage of mechanical energy, electrical energy, chemical energy, thermal energy; Industrial safety measures and ILO Convention and Recommendations in the furtherance of safety and health.

Unit-II

Industry energy systems, Properties of steam - Steam distribution (Assessment of steam distribution losses, Steam leakages, Steam trapping) - Condensate recovery and flash steam utilisation system. Identifying opportunities for energy savings. Thermal insulation. boiler – efficiency testing, excess air control, steam boiler monitoring. Electrical Systems: Demand control, power factor correction, load scheduling/shifting. Lighting, lighting levels, efficient options, fixtures, day lighting, timers, Energy efficient windows.

Unit-III

Waste Heat Recovery: Recuperators, regenerators, heat pipes, heat pumps. Cogeneration - concept, options (steam/gas turbines/diesel engine based), selection criteria, control strategy. Heat exchanger networking - concept of pinch, target setting, problem table approach, composite curves. Demand side management. Energy conservation in Pumps, Fans (flow control), Compressed Air Systems, Refrigeration and air conditioning systems, boilers, and furnaces.

Unit-IV

Hydrogen fuel technology- production of hydrogen from electrolysis and photochemical methods, hydrogen storage technologies, fuel cell systems, hydrides as fuels. Energy Saving Measures in Energy Intensive Process Industries – Pulp and Paper, Sugar, Textile, Fertilizer and their case studies. Chemical, Petrochemical Processes, Chlor-Alkali and their case studies. Aluminium, Iron and Steel, Cement and their case Studies; Railways, Ports, Transport Sector, Power Stations and their case studies.

Suggested Reading:

1. Zoran K. Morvay and Dusan D. Gvozdenac, 2008 “Applied Industrial Energy and Environmental Management”, John Wiley.
2. Guide book for “National Certification Examination for Energy Managers and Energy Auditors” 2007, Dr. Ambedkar Institute of Productivity, National Productivity Council, Chennai.
3. Doty S. and Turner W.C., 2012, “Energy Management Handbook” Eighth Edition, Wiley Eastern Publication, New York.
4. Dryden I.G.C. 1982, “The Efficient Use of Energy”, Butterworths, London,.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MEMT 302-EL-2A

	PO1	PO2	PO3	PO4	PO5	PO6
C302EL2A.1	2	-	-	3	1	3
C302EL2A.2	-	-	2	3	2	3
C302EL2A.3	-	2	-	2	2	3
C302EL2A.4	-	-	1	3	2	3
C302EL2A.5	2	2	2	2	2	2
C302EL2A.6	-	-	-	2	2	3
Average	2	2	1.7	2.5	1.8	2.8

CO-PSO MAPPING for MEMT 302-EL-2A

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C302EL2A.1	1	1	1	1	1	2
C302EL2A.2	1	-	2	2	2	3
C302EL2A.3	2	1	1	2	2	2
C302EL2A.4	2	2	2	3	3	2
C302EL2A.5	2	2	1	2	2	1
C302EL2A.6	3	-	2	3	3	3
Average	1.83	1.5	1.5	2.17	2.17	2.17

**ENERGY FROM WASTE
MEMT-302 (EL-2B)**

Max.Marks: 60+40

Total Credits: 04

Time: 3 Hours

Objectives:

The aim of this course is to give information about different sources of the waste which can be utilized in efficient energy generation. The students will get opportunity to know about the biochemical conversions, thermochemical conversions, biomass gasification and bioethanol production, generation of energy from the waste and their environmental impacts.

Outcomes: On successful completion of this course, the students will be able to:

- CO1** Understand different sources of wastes and various properties of wastes as a fuel
- CO2** Select technologies for waste disposal and energy recovery from wastes
- CO3** Apply the concepts of thermo and bio-chemical process along with newer technologies of energy generation from wastes.
- CO4** Identify environmental impacts of energy generation techniques
- CO5** Have knowledge of biofuels, their production and purification methods, and applications in the country economy.
- CO6** Apply the knowledge about the operations of waste to energy plants

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit-I

Definition, classification and sources of waste; physical, chemical and biological properties of waste as a fuel; Waste handling before thermal conversion, Preparation of recycled fuel, Mass combustion of waste, Combustion of recycled fuel. Emission reduction during combustion.

Unit-II

Technologies for solid waste disposal and recovery of energy from municipal solid waste and industrial waste, Organic waste blending systems, Utilization and treatment of fly ash, land-fill gas utilization in energy production. Energy generation from waste: Refuse Derived Fuel (RDF) - waste to energy- design and fuel analysis. Vocational prospects of waste to energy.

Unit-III

Biochemical conversions: sources of energy generation: industrial waste, agro residues; anaerobic digestion biogas production; types of biogas plant Thermochemical conversions: sources of energy generation, Industrial applications of gasifiers, Briquetting; utilization and advantages of briquetting; Environmental impacts of biochemical and thermochemical conversion.

Unit-IV

Biomass: procedures of characterization, Integrated biomass gasification for electricity generation. Bio-energy as byproduct of waste processing, bioenergy assessment; biomethanation from sludge digestion, types of reactors, UASBR (Upper Anaerobic Sludge Blanket Reactor), Biorefinery concept.

Alcohol fuels: vegetable oil as fuels, bioethanol production and technology; biodiesel, biohydrogen technology: potential of organic waste for hydrogen production; biofuel refining and technology; commercial biomass energy markets and economics.

Suggested Readings:

1. Lal B., Reddy MRVP, 2005. *Wealth from Waste*, Rajkamal Electric Press, Delhi.
2. Cleveland C.J., 2008. *Encyclopedia of Energy*, Elsevier, New Delhi
3. Bhatia S.C., 2007. *Solid and Hazardous Waste Management*, Nice Printing Press, Delhi.
4. Wall J.D., Harwood C.S., Demain A., 2008. *Bioenergy*, Printed in USA.

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MEMT 302-EL-2B

	PO1	PO2	PO3	PO4	PO5	PO6
C302EL2B.1	2	2	2	-	2	1
C302EL2B.2	2	2	-	3	3	3
C302EL2B.3	3	3	2	2	2	3
C302EL2B.4	-	-	-	2	2	2
C302EL2B.5	3	3	2	2	3	3
C302EL2B.6	2	2	-	2	3	3
Average	2.4	2.4	2	2.2	2.5	2.5

CO-PSO MAPPING for MEMT 302-EL-2B

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C302EL2B.1	1	1	1	-	1	1
C302EL2B.2	3	3	2	3	2	3
C302EL2B.3	2	2	2	3	3	3
C302EL2B.4	1	-	2	1	-	2
C302EL2B.5	2	3	1	3	2	2
C302EL2B.6	2	1	2	3	3	3
Average	1.8	2	1.7	2.6	2.2	2.3

ENVIRONMENTAL MODELLING
MEMT- 302 (EL-2C)

Max. Marks: 60+40

Total Credits: 04

Time: 3 Hours

Objectives:

The course provides students with advance knowledge on predictive and forecasting modelling tools and techniques to be used in environmental and energy systems and for their analysis. The students will develop a broader understanding of tools of environmental modelling and techniques used for applications in predictive and forecasting services.

Outcomes: On completion of this course, the students will have:

- CO1** A basic understanding on model development and about the concepts of system and simulation.
- CO2** An understanding about different modelling practices such as simple and complex calculation models, linear and non-linear models, optimization models, probabilistic models.
- CO3** An understating about the predictive and forecasting modelling of air pollution and its transport.
- CO4** Knowledge on surface water modeling and groundwater modeling techniques.
- CO5** Basic competency in skills with application of modelling techniques in the different environmental applications such as natural resource management, climate change, forecast services, and energy policy analysis.

Note:-

For final theory exam, time allotted will be of 3 hours and nine questions will be set. Question No.1 (objective/short answer type) covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit-wise with two questions from each Unit. The candidates will be required to attempt Q.No.1 and any four, selecting one question from each unit. All the questions will carry equal marks.

Unit I

Principles of model development and solution for environmental systems (air, water and soil), Basic steps in the model development: problem definition, model design and development and evaluation. Concept of system modeling and simulation. Simple and complex calculation models, linear and non-linear models, Time series analysis.

Unit II

Optimization models and their evaluation, Probabilistic methods for modeling: weibull, gamma and lognormal models. Predictive and Forecasting modeling of air pollution, hydrology and climate change. Gaussian plume model, gradient transport, eddy diffusion modeling, modelling fugitive emissions,

Unit III

Modeling of Spatio-Temporal Dynamics, Surface water modeling: DO sag model, BOD model, Eutrophication model, Elements of groundwater modeling, Case study: predicting the mixing

and dispersion of air pollutants in the environment, GIS-based human exposure modeling system for traffic air pollution.

Unit IV

Model applications in the area of climate change, air and water pollution, biodiversity, and natural resource management. Forecast service, Social and economic aspects of environmental modelling, Role of modeling in energy policy analysis.

Suggested Readings:

1. John, W. and Mark, M. (eds). 2004. Environmental Modeling: Finding Simplicity in Complexity, John Wiley and Sons Inc., New York.
2. Andrew Ford, 2009. Modeling the Environment, Island Press; 2 edition
3. Jo Smith, Peter Smith, 2007. Environmental Modelling: An Introduction. Oxford University Press.
4. Fung, F., Lopez, A. and New, M. (eds.). 2011. Modelling the impact of climate change on water resources. Willey-Blackwell Ltd., U.K.
5. Barnsley, Michael, J. 2007. Environmental Modelling: A practical introduction. CRC Press, USA

Teaching-Learning Process

- **Lectures:** Supported by black board teaching, power point presentations, related videos and demonstrations.
- **Assignments and exercises**
- **Test:** Knowledge of the students is tested through surprise tests, quiz, sessional tests and seminars.

CO-PO MAPPING for MEMT 302-EL-2C

	PO1	PO2	PO3	PO4	PO5	PO6
C302EL2C.1	2	1	-	3	3	2
C302EL2C.2	2	1	-	3	3	3
C302EL2C.3	2	2	-	2	2	3
C302EL2C.4	2	2	-	2	2	3
C302EL2C.5	2	2	2	3	3	3
Average	2	1.6	2	2.6	2.6	2.8

CO-PSO MAPPING for MEMT 302-EL-2C

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C302EL2C.1	1	-	2	1	1	1
C302EL2C.2	3	-	2	1	-	2
C302EL2C.3	2	-	2	2	-	2
C302EL2C.4	2	-	2	2	-	2
C302EL2C.5	3	2	3	3	2	3
Average	2.2	2	2.2	1.8	1.5	2

Dissertation Work
MEMT-401

Max. Marks:250

Total Credits: 10

Objectives

The dissertation provides practical knowledge and skills in the area of energy and environment in the industry or research institute or consultancy. The students receive analytical and problem-solving skills to implement solutions to firm-specific problems which, in turn, also enhance their career prospects.

Outcomes: On completion of the dissertation, the students will be able to:

CO1 Implement knowledge and skills they learnt during the programme in solving specific energy and environment management problems.

CO2 Develop competencies for research, innovations and practical applications.

CO-PO mapping matrix for MEMT-401

	PO1	PO2	PO3	PO4	PO5	PO6
C401.1	3	3	3	3	3	3
C401.2	3	2	2	3	3	3
Average	3	2.5	2.5	3	3	3

CO-PSO mapping matrix for MEMT-401

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C401.1	3	3	3	3	3	3
C401.2	3	3	3	3	3	3
Average	3	3	3	3	3	3

**Progressive Seminar/Laboratory Development Work
MEMT-404**

**Max. Marks: 50
Total Credits: 02**

Objectives :

The Progressive Seminar/Laboratory Development work provides an opportunity to students to present the work they executed during their dissertation in industries/organizations, physical laboratories and virtual laboratories such as computer-simulated modelling. The progressive seminar/laboratory learning provides opportunities for students to relate and strengthen the theoretical/practical concepts they learn.

Outcomes: Through seminars and lab development work, the students learn to:

- CO1.** Present their work including methods adopted, techniques learnt and practical competence acquired during the dissertation.
- CO2.** Enrich their knowledge/learning in emerging areas related to the subject.

CO-PO mapping matrix for course Progressive Seminar/Laboratory Development Work

	PO1	PO2	PO3	PO4	PO5	PO6
C404.1	3	3	3	3	3	3
C404.2	2	2	2	3	2	3
Average	2.5	2.5	2.5	3	2.5	3

CO-PSO mapping matrix for course Progressive Seminar/Laboratory Development Work

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C404.1	3	2	2	2	2	3
C404.2	3	3	3	2	2	3
Average	3	2.5	2.5	2	2	3

M.Tech (Energy and Environmental Management)

CO-PO-PSO mapping matrix for all the courses of M.Tech. (Energy and Environmental Management)

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C101	2.14	2.29	1.5	2	2.14	2.57	1.5	1.7	1.86	1.75	2.75	1.5
C102	1.5	1.67	-	2.33	1.5	2.17	1.7	2.7	1.5	2.2	1.6	2.0
C103	2.25	1.5	1.75	2.63	1.8	2.5	2.13	1.6	1.88	1.71	1.6	1.75
C104	2.5	2.5	1.67	2	2	2.83	1.5	1.5	2.17	1.5	1.5	2.5
C201	2.5	1.5	1.5	2.33	1.5	2.67	2.33	1.5	2.33	1.6	2.33	2.67
C202	2.4	-	1.5	2.5	1.5	2.5	2.33	2.33	1.7	2	2	2.33
C203	-	1.8	-	2.33	2	2.83	2.33	1.7	2.17	2.5	1.75	3
C204	2.67	1.5	2.25	2.33	2.5	2.67	2	2.5	1.67	2	1.75	3
C301EL1A	-	1.5	1.5	2.5	1.67	2.5	2.17	2.4	1.75	2.4	2.17	2
C301EL1B	2.8	2.6	1.6	2.0	2.4	2.8	2.2	1.5	2.5	2.2	1.6	2.2
C301EL1C	1.5	2	1.83	2.25	1.83	2.75	1.75	1.5	1.71	1.67	1.5	2.13
C302EL2A	2	2	1.7	2.5	1.8	2.8	1.83	1.5	1.5	2.17	2.17	2.17
C302EL2B	2.4	2.4	2	2.2	2.5	2.5	1.83	2	1.7	2.6	2.2	2.33
C302EL2C	2	1.6	2	2.6	2.6	2.8	2.2	2	2.2	1.8	1.5	2
C401	3	2.5	2.5	3	3	3	3	3	3	3	3	3
C404	2.5	2.5	2.5	3	2.5	3	3	2.5	2.5	2	2	3

B.Ed.-2Year (Gen) Programme

**Learning Outcome Based Curriculum Framework
(LOCF)**

w.e.f. Session 2020-21



**KURUKSHETRA UNIVERSITY
KURUKSHETRA**

(Established by the State Legislature Act-X-II of 1956)

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	Course 6 & 7 - Note:-	
	(a) Students can opt for any only two school subjects.	
	(b) They have to opt for one school subject from each group except for Science, Commerce & Shastri/B.A. (Skt Hons)/M.A. (Skt) students.	
	(c) Science students can opt for two school subject from Pedagogy of Sciences (Group-I).	
	(d) Shastri / B.A. (Skt Hons)/ M.A. (Skt) student can opt for two school subjects i.e. Pedagogy of Hindi & Pedagogy of Skt. from Group-III.	
	(e) Commerce students can opt for two school subjects from Pedagogy of Social Sciences (Group-II).	
	Group –I Pedagogy of Sciences:	
	(i) Pedagogy of Science (ii) Pedagogy of Biological Science	
	(iii) Pedagogy of Computer Science (iv) Pedagogy of Home Science	
	(v) Pedagogy of Physical Science	
	Group- II Pedagogy of Social Sciences:	
	(i) Pedagogy of Social Science (ii) Pedagogy of Commerce	
	(iii) Pedagogy of Economics (iv) Pedagogy of History	

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	(v) Pedagogy of Geography	(vi) Pedagogy of Art	
	(vii) Pedagogy of Music		
	Group- III Pedagogy of Languages:		
	(i) Pedagogy of English	(ii) Pedagogy of Hindi	
	(iii) Pedagogy of Punjabi	(iv) Pedagogy of Sanskrit	
	Group- IV Pedagogy of Mathematics:		
	(i) Pedagogy of Mathematics		
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809	Course 6& 7	(iii) Pedagogy of Computer Science	
810	Course 6& 7	(iv) Pedagogy of Home Science	
811	Course 6& 7	(v) Pedagogy of Physical Science	
812	Course 6& 7	(vi) Pedagogy of Social Science	
813	Course 6& 7	(vii) Pedagogy of Commerce	
814	Course 6& 7	(viii) Pedagogy of Economics	
815	Course 6& 7	(ix) Pedagogy of History	
816	Course 6& 7	(x) Pedagogy of Geography	
817	Course 6& 7	(xi) Pedagogy of Art	
818	Course 6& 7	(xii) Pedagogy of Music	
819	Course 6& 7	(xiii) Pedagogy of English	
820	Course 6& 7	(xiv) Pedagogy of Hindi	
821	Course 6& 7	(xv) Pedagogy of Punjabi	
822	Course 6& 7	(xvi) Pedagogy of Sanskrit	
823	Course 6& 7	(xvii) Pedagogy of Mathematics	
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826	Course 10	- Creating and Inclusive School	
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829		(ii) Peace Education	
830		(iii) Health, Physical & Yoga Education	
		(iv) Guidance and Counselling	
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841	(v) Pedagogy of Physical Science	
842	(vi) Pedagogy of Social Science	
843	(vii) Pedagogy of Commerce	
844	(viii) Pedagogy of Economics	
845	(ix) Pedagogy of History	
846	(x) Pedagogy of Geography	
847	(xi) Pedagogy of Art	
848	(xii) Pedagogy of Music	
849	(xiii) Pedagogy of Hindi	
850	(xiv) Pedagogy of English	
851	(xv) Pedagogy of Punjabi	
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KURUKSHETRA UNIVERSITY, KURUKSHETRA COURSE DISTRIBUTION (YEAR WISE) & SCHEME OF EXAMINATION (w.e.f.2020-21)

B.Ed-1st Year

Paper	Nomenclature	Maximum Marks			Periods per week	Exam Hour	Credits	Credit hours (per week)
		Total	External	Internal/ Practicum				
801	Childhood and Growing Up	100	80	20	4	3hrs.	4	4
802	Contemporary India and Education	100	80	20	4	3hrs.	4	4
803	Learning and Teaching	100	80	20	4	3hrs.	4	4
804	Language across curriculum	50	40	10	2	1:30hrs	2	2
805	Understanding, Disciplines and subjects	50	40	10	2	1:30hrs	2	2
806	Gender, School and Society	50	40	10	2	1:30hrs	2	2
807-	Pedagogy of a School Subjects- I	100	80	20	4	3hrs.	4	4
823	Pedagogy of a School Subjects- II	100	80	20	4	3hrs.	4	4
Enhancing Professional Capacities (EPC)								
831	(i) EPC-1 Reading and Reflection on Text	50*	25*	25*	4	1:30hrs	2	2
833	(ii) EPC-3 Critical Understanding of ICT	50*	25*	25*	4	1:30hrs	2	2
837-853	School Internship Programme & Engagement with the Field (4 weeks)	...	...	...	...	...	...	...
Course -14A OES S/ MOO Cs** *	The students are required to opt any one OESS/ MOOCs Course (available during the ongoing session of B.Ed. Programme) being offered by any Department/ University.	50**	50**	---	0	---	---	---
Total		650	520	130	26		26	

*External Exam for this course will be held at the end of 2nd Year.

** Marks not added in the aggregate.

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***The students are required to opt one OESS in First Year and one MOOCs Courses (available on SWAYAM Portal) in Second Year (or as per the guidelines or directions issued by the regulatory bodies or university in this regard from time to time)

Note:-

- (a) Students can opt for any only two school subjects.
- (b) They have to opt for one school subject from each group except for Science, Commerce & Shastri/B.A. (Skt Hons)/M.A. (Skt) students.
- (c) Science students can opt for two school subject from Pedagogy of Sciences (Group-I).
- (d) Shastri / B.A. (Skt Hons)/ M.A. (Skt) student can opt for two school subjects i.e. Pedagogy of Hindi & Pedagogy of Skt. from Group-III.
- (e) Commerce students can opt for two school subjects from Pedagogy of Social Sciences (Group-II).

Group –I Pedagogy of Sciences:

- (i) Pedagogy of Science (ii) Pedagogy of Biological Science
- (iii) Pedagogy of Computer Science (iv) Pedagogy of Home Science
- (v) Pedagogy of Physical Science

Group- II Pedagogy of Social Sciences:

- (i) Pedagogy of Social Science (ii) Pedagogy of Commerce
- (iii) Pedagogy of Economics (iv) Pedagogy of History
- (v) Pedagogy of Geography (vi) Pedagogy of Art
- (vii) Pedagogy of Music

Group- III Pedagogy of Languages:

- (i) Pedagogy of English (ii) Pedagogy of Hindi
- (iii) Pedagogy of Punjabi (iv) Pedagogy of Sanskrit

Group- IV Pedagogy of Mathematics:

- (i) Pedagogy of Mathematics

B.Ed-2 Year (Gen.) Syllabus / 2020-21/K.U.K

B.Ed.- 2nd Year

Paper	Nomenclature	Maximum Marks			Periods per week	Exam Hour	Credits	Credit hours (per week)
		Total	External	Internal/ Practicum				
824	Knowledge and Curriculum	100	80	20	8	3hrs.	4	4
825	Assessment for Learning	100	80	20	8	3hrs.	4	4
826	Creating an Inclusive School	50	40	10	4	1:30hrs	2	2
827	Optional Course							
	(i) Environment Education	50	40	10	4	1:30hrs	2	2
	(ii) Peace Education	50	40	10	4	1:30hrs	2	2
	(iii) Health & Physical Education	50	40	10	4	1:30hrs	2	2
	(iv) Guidance and Counselling	50	40	10	4	1:30hrs	2	2
831	Enhancing Professional Capacities (EPC)							
	I. Reading and Reflection on Text	50	25	25	4	1:30hrs	2	2
	II.EPC-2 Drama & Art in Education	50	25	25	4	1:30hrs	2	2
	III.EPC-3 Critical Understanding of ICT	50	25	25	4	1:30hrs	2	2
	IV. Understanding the Self	50	25	25	4	1:30hrs	2	2
837-853	School Internship Programme & Engagement with the Field (16 weeks)							
	Pedagogy-I	175	100	75	...	...	16	16
	Pedagogy-II	175	100	75	...	...
Course-14B OESS/ MOOCs ***	The students are required to opt any one OESS/ MOOCs Course (available during the ongoing session of B.Ed. Programme) being offered by any Department/ University.	50**	50**	---	0	---	---	
	Total	850	540	310				

PROGRAMME OUTCOMES (POs)

After successful completion of the program:

- PO1 Learners will be able to comprehend the acquire knowledge during the Program of study.
- PO2 Learners will be able to reflect on the issues relating to the discipline- 'education'.
- PO3 Learners will be able to exhibit the professional skills and competencies acquired during the Program of study.
- PO4 Learners will be able to show scientific & research capabilities in their academic, professional and general life pursuits.
- PO5 Learners will be able to apply the knowledge and skills acquired in academic planning, organizing, evaluation, decision making, resource management according to pre-determined objectives/outcomes.
- PO6 Learners will be able to work as member or leader in various teams and multidisciplinary & diverse settings.
- PO7 Learners will be able to discuss and solve the problems relating to the discipline and life.
- PO8 Learners will be able to state and follow the ethical issues relating to the discipline and society.
- PO9 Learners will be able to apply different tolls and techniques of communication and related skills.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

The B.Ed-2yr (Gen), a pre-service teacher education programme at secondary level aims at:

- PSO-1.** Acquiring conceptual understanding of sociological, psychological and philosophical aspects of an individual's development and its relationship with teaching-learning process.
- PSO-2.** Visualizing enshrined legislative provisions related to Indian Education system and facilities in an inclusive setting.
- PSO-3.** Providing integrated learning experiences within the socio-cultural milieu of the learners to respond to the diversities in the class-room.

PSO-4. Nurturing pedagogic, aesthetic and literary skills of an individual for self analysis and behaviour modification.

PSO-5. Providing opportunity for experiential learning to conceptualize disciplinary understanding and empirical knowledge of school curriculum to assess and reflect on teaching-learning practices

PSO-6. Providing exposure to ICT tools for their effective utilization in providing learning experiences as well as management of school activities.

PSO-7. Exploring the role of social agencies, school and society in nurturing holistic well-being and promoting healthy practices.

PSO-8. Sensitizing towards environmental issues and language background of students.

PSO-9. Identifying challenges of gender disparities, exposure to gender neutral pedagogic materials and training to address the gender inequalities.

PSO-10. Providing firsthand experience of all the school activities through engaging student-teachers as interns at secondary and senior-secondary stage.

Course 1 (801)

CHILDHOOD AND GROWING UP

Course Code : 801

Max. Marks:100

Time: 3 Hours

(Theory: 80, Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.**
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short - answer type Questions of 4 marks each to be selected from the entire syllabus.**
- iii. Two long answer type questions will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.**

Course Outcomes

After transaction of the course, student teachers will be able to:

- 801.1** Explain the Meaning, Concept and Characteristics of Growth, maturation and development at various stages.
- 801.2** Describe the problem of Childhood and adolescent age especially with respect to the Indian context.
- 801.3** Develop an understanding of different aspects of a child's Cognitive, Social, Emotional & Moral development.
- 801.4** Become familiar with Theories of Child development and their Educational implications.
- 801.5** Understand the developing Individual / Learner from different dimensions i.e. Intelligence, Creativity & Personality.
- 801.6** Acquaint with various Mental Processes of Learning i.e. Thinking, Memory & forgetting.
- 801.7** Get familiar with the role of Family, School, Community, Society & different cultural practices in the developmental process of Children.
- 801.8** Acquaint with contemporary issues (issue of marginalization & Stereotyping , Gender, Social class & poverty) in child development and describe the role of media in constructing & deconstructing perceptions & ways of dealing with above issues.

Course Content

Unit – I

1. Dimensions of Development

- Growth & Development: - Concept, Principal, Factors, & Stages.

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- Characteristics of stages development with special reference to Childhood and Adolescence.
- Adolescence: Understanding their needs and problems in Indian context.
- Parenting styles: Concept and its impact Child development.
- Personality: meaning, nature and assessment.

Unit – II

2. Theories of Child Development

- Theory of Cognitive Development by Piaget: Concept, Stages and Implications with special reference to Indian Context.
- Theory of Social & Emotional Development by Erickson: Concept, Stages and Implications with special reference to India Context.
- Kohlberg theory of Moral Development: Concept, Stages and Implications with special reference to India Context.

Unit-III

3. Learner as a Developing Individual

- Intelligence: Meaning, nature and theories of intelligence (two factor theory and Thurston's group factor theory, Measurement of intelligence and application of intelligence tests.
- Creativity: Concept; relationship with intelligence; techniques for fostering creativity.
- Mental Processes of Learning: Thinking Concept Types of Thinking – Divergent, Convergent, Critical, Reflective & Lateral Thinking.
- Memory – Concept, Types & Strategies to develop Memory; Forgetting – Nature, Causes, Factors & Strategies to minimize Forgetting.

Unit- IV

4. Learning in socio Cultural Perspective

- Agencies of Socialization: Family, School, Community and their role in Child Development.
- Social & Cultural Change as factors influencing Child Development.
- Impact of Marginalization and Stereotyping on Child Development with special reference to Gender, Social Class & Poverty.

Role of media in constructing & deconstructing perceptions & ways of dealing with above issues.

Practicum/ Sessionals

Any one of the following:

- i. Case-study of an adolescent: Problems and Needs.
- ii. Seminar/ Presentation on educational implications of One Learning theory of child development.
- iii. Survey report on impact of socio-economic status of a family on child.
- iv. Content Analysis of Media coverage on the following:
 - a. Child labour.
 - b. Gender bias.
 - c. About Disability.
- v. Play/drama on value orientation & character building and preparing a report.
- vi. Protecting the culture and indigenous practices: Compilation of local folk songs, folk tales, riddles and toys.
- vii. Observation of children during their playtime in a rural school and preparing a report .

Suggested Readings:

- Aggarwal, J.C. (1995). *Essentials of Educational Psychology*, New Delhi: Vikas Publishing House Private Limited,
- Allport, G.W. (1961). *Pattern and Growth in Personality*:New York.
- Chauhan, S.S. (2002). *Advanced Educational Psychology*. New Delhi: Vikas Publishing
- Gore, M.S.(1984). *Education and Modernization in India*. Jaipur:Rawat Publishers.
- H.Havighurst, R. et al.(1995). *Society and Education*. Baston: Allyn and Bacon
- H.P.BWheldall, K. (2006). *Developments in Educational psychology*. New York: Routledge
- Kamat, A.R.(1985). *Education and Social Change in India*. Bombay: Samaiya Publishing Co.
- Bhatia, K.K. (2008). *Basis of Educational Psychology*.Ludhiana:Kalyani Publishers.
- Sharma, K.N. (1990). *Systems, Theories and Modern Trends in Psychology*.Agra:
- Woolfork, A (2004). *Educational Psychology: Reason Education (Singapore)*. New Delhi: Indian Branch.

Course: 2(802)
CONTEMPORARY INDIA AND EDUCATION
Course Code : 802

Max. Marks:100
(Theory:80,Internal: 20)

Time: 3 Hours

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.**
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short - answer type Questions of 4 marks each to be selected from the entire syllabus.**
- iii. Two long answer type question will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.**

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 802.1** understand the Equality of opportunities in Education, Fundamental rights, duties and Directive Principles of state policies and its impact on Education.
- 802.2** Explain the concept of Diversity, Concerns related to Socially disadvantaged segment of the society..
- 802.3** Describe the significant recommendations of Commission before Independence related to Secondary Education.
- 802.4** understand the Work Education and Experiential learning in context of Nai Talim..
- 802.5** Understand the Objectives and Recommendation of the policies after Independence related to Secondary Education.
- 802.6** Explain the major features of New Education Policy 2020.
- 802.7** Develop and understanding of emerging issues related to Contemporary India and its impact on Education.
- 802.8** Evaluate the Govt Policies of Universalisation of School Education ie DPEP, MDM, SSA, RMSA & IEDSS.

Course Contents

Unit – I

1. **Indian Constitution and Status of Education:**

- Equality of opportunities in education: Article 28, 29, 350 and 351 and their issues.
- Education and Fundamental Rights and Duties: Article 14, 15, 16, 21-A, 30 and 51A.
- Directive Principles of state policies

2. **Diversity in Society and Implications for Education:**

- Social diversities based on Castes, Languages, Religions and Regions,.
- Status of Education of Socially disadvantaged segments namely SC, ST, OBC, Women, PWD'S and minorities.
- Right to Education Act 2009: right of children to free and compulsory education

Unit – II

3. **Educational Committees and Commission before independence with special reference to:**

- Maculay's minutes: Its features and recommendations
- Adam's Report: features and its recommendations.
- Woods Despatch of 1854: Recommendations Merits and demerits
- Basic Scheme of Education 1937: objective, merits and demerits ; Concept & need of Nai Talim and philosophy of work education and experiential learning for rural reconstruction.

Unit – III

4. **Educational Committees and Commission after independence with special reference to:**

- Secondary Education Commission (1952-53): objectives and recommendations.
- Indian Education Commission (1964-66): objectives and recommendations.
- National policy on Education (1986): objectives and recommendations
- Revised National Policy 1992
- POA(1992): Major features.
- New Education Policy 2020.

Unit – IV

5. **Contemporary Issues in Indian Education**

- Universalization of school Education and DPEP, MDM, SSA, RMSA and IEDSS
- Vocationalization of Secondary Education: need and implications.
- Emotional Integration and international understanding in the context of globalization.
- Modernization: Concept, merits and demerits.
- Sustainable development goals(UN) 2015.
- Concept and Importance of Road Safety, Road Safety rule and regulation, Traffic Sign Road Safety measures, legal mandates of Road Safety.
- **Practicum/Sessionals**
Any one of the following:

- i. Revisiting educational policies framed for the education of different sections of the society SC/ BC/Minorities/ Women.

- ii. Prepare a report on problems of secondary education.
- iii. Review educational policies for vocational education.
- iv. Review of Policies related to universalization of school education.
- v. Case study of a school on Community Engagement, Conduct & Outcome of SMC meetings.
- vi. Panel Discussion on Gandhi's idea on Education and their relevance in present day context.
- vii. Survey on literacy levels and out of school children in any locality.

Suggested Readings:

- Bhattacharya & Srinivas. (1977). *Society and Education*, Calcutta: Academic Publications.
- Deshpande, S.(2004). *Contemporary India: A sociological view*. New Delhi: Penguin. Dubey, S.C. (2001). *Indian Society*, New Delhi: National Book trust.
- Government of India (GOI) (2009). *Right to education Act*. New Delhi: MHRD.
- Ghanta, R. & Dash, B. N. (2005). *Foundations of Education*, Hyderabad: Neelkamal Publications.
- Kashyap, S.C. (2009). *The constitution of India*, New Delhi: National Book latest edition.
- Mishra, B.K. & Mohanty, R.K. (2003). *Trends and issues in India Education*, Meerut: Suryapublications.
- Ministry of Human Resource Development of India (1986). *National policy on education*. NCERT, 1964-1966. Educational and national Development: report of the education commission, New Delhi: NCERT.
- Rajput, J.S. (1994). *Universalisation of Elementary Education*, New Delhi: Vikas Publishing House.
- Right to education Act, (2009). *Gazette*. Notification of central Government.
- Sachdeva, M.S. et.al (2011). *Philosophical, Sociological and Economic bases of Education*, Patiala: Twenty First Century Publications.
- Shankar Mukharji. (2007). *Contemporary issues in modern Indian education*, Authors Press.
- Stormquist, Nelly P.(2002). *Education in a Globalised world*. New York: Rowman & Little field publishers.
- Walia, J.S.(1979). *Modern Indian Education and its Problems*, Jalandhar City: Paul Publishers, Gopal Nagar.
- Walia, J.S.(2014). *Philosophical, Sociological and Economic Bases of Education*. Jalandhar: Ahim Paul Publishers.
- <http://www.gandhi-manibhawan.org/gandhicomslive/speech8.html>
- <http://www.mksgandhi.org/speeches/speech Main.html>

LEARNING & TEACHING

Course Code : 803

Max. Marks :100

Time: 3 Hours

(Theory:80,Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short - answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type question will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes(COs)

After transaction of the course, student teachers will be able to:

- 803.1** Understand the Concept of learning and learning strategies.
- 803.2** Identify the individual differences among the learners.
- 803.3** Explain paradigms of learning.
- 803.4** Describe the educational implications of different theories of learning.
- 803.5** Understand the Concept of teaching and identify the variables in the teaching process.
- 803.6** Explain the applications of social constructivist approach in teaching and learning.
- 803.7** Describe the phases & models of teaching.
- 803.8** Understand and make effective uses of different Teaching Strategies.

Course Contents

Unit-I

1. UNDERSTANDING LEARNING

- Learning: Concept, Nature, types of learning & Factors influencing learning,.
- Learning strategies: Co-operative learning & Collaborative learning, peer-tutoring, group learning.
- Role of Teacher & School in relation to learning strategies.
- Individual Differences: Concept, Types, Causes & Educational implications.

Unit-II

2. LEARNING PARADIGM

- Theories of Learning :
 - Connectionism theory (Trial & Error: Thorndike), concept, laws of learning & Educational Implications.
 - Conditioning theories: Classical conditioning (Pavlov) & Operant Conditioning (Skinner): Concept, characteristics and Educational Implications.
 - Social-constructivist theory (Vygotsky & Bandura): Concept, Nature and Educational implications.

Unit-III

3. UNDERSTANDING TEACHING

- Teaching: Concept, characteristic, features and levels of teaching.
- Related concepts of Teaching (Training, conditioning, instruction & indoctrination)
- Variables in the Teaching Process: The Learning task (Instructional Objectives), Learning Behaviour (Entry behaviours & Learner's characteristics) Teacher Behaviour: (Competence, Personality, Teaching Style).
- Social-constructivist approach in teaching (Applications of Bruner, Ausubel & Vygotsky's ideas in teaching).

Unit-IV

4. PHASE & MODELS OF TEACHING

- Phase of Teaching: Pre-active, Interactive and Post-active.
- Models of Teaching: Meaning, Need & Elements, Basic Teaching Model (Glaser), Concept Attainment Model (Bruner).
- Teaching Strategies: Brain-Storming, Simulation, Role-playing, Gaming, Remedial teaching & Enrichment Programme.

Practicum/ Sessional

Any one of the following

- i. Group Projects: Observation report on Teaching-learning transaction process in School teaching practice.
- ii. Seminar/ Presentation on learning theories.
- iii. Application of teaching strategies (Brain-Storming, Simulation, Role-playing, Gaming, Remedial teaching) on any current/ social issue.
- iv. Case-study on Individual differences.

v. Application of participatory learning and action techniques of resource mapping and social mapping.

Suggested Readings:

Chauhan, S.S. (2014). *"Innovations in Teaching Learning Process"*, Noida: Vikas Publishing House Private Ltd.

Dececco, J.P. (1988) *"The Psychology of Learning and Instruction"*, New Delhi: Prentice Hall.

Gagne, R.M. (1977). *"The conditions of learning"*, New York, Chicago: Holt, Rinehart and Winston.

Joyce, B. & Weil, M. (1992). *"Models of Teaching"*, New Delhi, Prentice Hall.

Kulkarni, S.S. (1986). *"Introduction to Educational Technology"*, New Delhi: Oxford & IBH Publishing Company.

Pandey, K.P. (1983). *"Dynamics of Teaching Behaviour"*, Ghaziabad: Amitash Parkashan.

Pandey, K.P. (1980). *"A First Course in Instructional Technology"*, Delhi: Amitash Parkashan.

Skinner, B.F. (1968). *"The Technology of teaching"*, New York: Appleton Century Crofts.

Sharma, R.A. (1991). *"Technology of Teaching"*, Meerut: R. Lall Book Depot.

Sharma, S.K. (2005). *"Learning and Teaching: Learning process"*, Delhi: Gyan Books Private Ltd.

Srivastava, D.S. and Kumari, S. (2005). *"Education: Understanding the learner"*, Delhi: Gyan Books Private Ltd.

Walia, J.S. (2011). *"Technology of Teaching"*, Jalandhar: Ahim Paul Publishers.

Walia, J.S. (2012). *"Teaching Learning Process"*, Jalandhar: Ahim Paul Publishers.

Course 4(A) (804)

LANGUAGE ACROSS THE CURRICULUM

Course Code : 804

Max. Marks :50

Time: 1.30 Hours

(Theory: 40,Internal: 10)

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 8 marks. There will be two short - answer type Questions of 4 marks each to be selected from the entire syllabus.**
- iii. Two long answer type question 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 16 marks each.**

Course Outcomes(COs)

After transaction of the course, student teachers will be able to:

- 804.1** Know the concept of language, Multilingualism and language diversity with various functions of language.
- 804.2** Understand the relationship between language & learning and describe the elements of communicative approach.
- 804.3** Integrate different language skills for effective classroom discourse.
- 804.4** Analyze significance of language proficiency and knowledge acquisition.

Course Contents

UNIT-I

1. UNDERSTANDING LANGUAGE

- (i) Concept: Meaning & Nature of language
- (ii) Linguistic principles: Process of acquisition of language

2. Language & Learning

- (i) Functions of language & its basic assumptions: Communicative, Receptive & Expressive, Language and Society. First Language, Multilingualism. Language Diversity in class room.

3. Language Across Curriculum: - Relationship of language & learning, Role of Subject teacher.

UNIT-II

4. LISTENING & SPEAKING SKILL

- (i) Concept and Importance
- (ii) Techniques and Material for developing Listening and speaking skill oral conversational and compositional skills

5. Reading & Writing skill

- (i) Concept, need & Importance
- (ii) Techniques and Material for developing Reading and Writing, Reading Mechanics, Compositional writing.

6. Relationship of language Skills and subject knowledge of Teachers

Practicum/Sessionals

Any one of the following:

- (i) Subject wise group discussion, preparation of report and presentation before the group.
- (ii) Prepare a Diagnostic test to identify reading and writing problems of the school students.
- (iii) Prepare a representative sample of advocacy on rural issues / problems
- (iv) Letter writing, Notice, email messages representation on local issues and local challenges.
- (v) Reflections on Gandhian thoughts : Panel discussion and preparation of report

Suggested Readings:

Agnihotri, R.K. (1995). *Multilingualism as a classroom resource*. In K. Heugh, A. Siegruhn, & P. Pluddemann (Eds.), *Multilingual Education for South Africa* (pp. 3-7), Heinemann Education Groups.

Freedman, S.W. & Dyson, A.H. (2003). *Handbook of Research on Teaching English language Arts*. Lawrence Erlbaum Associates Inc, USA: New Jersey.

Government of India. (1986). *National Policy on Education*. GOI.

Grellet, F. (1981) *Developing Reading Skills: A practical guide to Reading Comprehension exercises*. Cambridge University Press.

Kumar, Krishna. (2007). *The child's language and the Teacher*. New Delhi: National Book.

Mangal, U.(2010). *Teaching of Hindi*, New Delhi: Arya Book Depot.

National Curriculum Framework (2005), New Delhi: NCERT.

Sachdeva, M.S. (2013). *Teaching of English*. Patiala: Twenty First Century Publications.

Safaya, Raghunath. *Methods of Teaching of Hindi*. Jalandhar :Punjab Book Depot.

Sinha, S. (2009). *Roseblatt's Theory of Reading*. Explaining Literature contemporary education dialogue. 6(2), PP223-237.

Sullivan, M. (2008). *Lessons for Guided writing*. scholastic. National curriculum framework. (2005).

<http://www.usingenglish.com/handouts/>

Course 4(B) (805)

UNDERSTANDING DISCIPLINES AND SUBJECTS

Course Code: 805

Max. Marks :50

Time: 1.30 Hours

(Theory: 40,Internal: 10)

NOTE FOR PAPER SETTER

- i. Paper setter will set five questions in all, out of which students will be required to attempt five questions.**
- ii. Q.No 1 will be compulsory and will carry 8 marks. There will be two short - answer type Questions of 4 marks each to be selected from the entire syllabus.**
- iii. Two long answer type question 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 16 marks each.**

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 805.1** Describe the characteristics and nature of discipline
- 805.2** Elaborate the concept of disciplinary knowledge and emergence of discipline and subject.
- 805.3** Critically analyze the sources of knowledge with respect to text books and journals
- 805.4** Acquaint with the paradigm shift in discipline

Course Content

Unit-I

1. EMERGENCE OF DISCIPLINARY KNOWLEDGE

- Meaning, nature and types of discipline.
- Role of disciplinary knowledge in the school curriculum.
- Emergence of school subjects and disciplines from philosophical, social and political contexts;
- emergence of teaching methods

Unit-II

2. DISCIPLINARY KNOWLEDGE: RELATED ISSUES

- Difference and relationship between curriculum & syllabus;
- A criteria for selection of textbooks, magazine & journals as source of knowledge.
- Role of different agencies and their functions in shaping the syllabus and text books at national & state level.

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Paradigm shifts in the nature of disciplines: Social Science, Mathematics, Science, Language

Practicum/ Sessional

Any one of the following:

- Critical analysis of a curriculum/ syllabus of particular school subjects.
- Evaluate a text book of secondary classes with reference to its adequacy and in achieving expected learning outcome.
- Review of text book in the light of connecting knowledge to life outside the school.
- Readings and group discussions on NCF-2005, NCFTE-2010, RTE-2009

Suggested Readings:

Bonrs, J.A. (2001). Cultural diversity and Education. Foundations curriculum and teaching (4th Ed) Boston: Allyn and Bacon.

Deng, Z (2013) school subjects and academic disciplines. In A. Luke , A. Woods, & Wer (Eds.), Curriculum syllabus design and equity: A primer and model. Routledge.

Krishna, A. (2009). What are Academic Disciplines? University of Southampton, NCRM E Prints Respositiry [eprints,ncrm.ac.uk/783/1/what_are_academic_disciplines.pdf](http://eprints.ncrm.ac.uk/783/1/what_are_academic_disciplines.pdf).

NCERT(2006). Position paper national focus group on curriculum, syllabus and textbooks. New Delhi: author. Available from http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/cst_final.pdf

NCERT (2006). Position paper national focus group on teaching of social sciences. New Delhi: Author Retrieved on April 21, 2015 from http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/social_sciencel.pdf

NCERT(2006). Position paper national focus group on teaching of Indian languages. New Delhi: Author Available from http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/Indian_Languages.pdf

NCERT (2006). Position paper national focus group on teaching of mathematics. New Delhi: Author Available from http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/math.pdf

NCERT(2006). Position paper national focus group on teaching of science. New deli: Author. Available from http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/science.pdf

Course-5 (806)
GENDER, SCHOOL AND SOCIETY
Course Code : 806

Time: 1.30 Hours

Max. Marks :50
(Theory: 40,Internal: 10)

NOTE FOR PAPER SETTER

- i. Paper setter will set five questions in all, out of which students will be required to attempt five questions.**
- ii. Q.No 1 will be compulsory and will carry 8 marks. There will be two short - answer type Questions of 4 marks each to be selected from the entire syllabus.**
- iii. Two long answer type question 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 16 marks each.**

Course Outcomes(COs)

After the transaction of the course, student teachers will be able :

- 806.1** To understand the basic concepts, issues and theories of Gender.
- 806.2** To familiarize with the processes of socialization at School and other social agencies.
- 806.3** To visualize psychological and sociological perspective of equity and equality.
- 806.4** To become aware about gender inequalities in school and society.

Course Content

Unit – I

1. GENDER STUDIES: CONCEPT AND THEORIES

- Concept of gender,Patriarch, Masculinity and Feminism, Issues of masculinity and femininity
- Theories on Gender and Education.
 - (i) Symbolic Interaction Theory
 - (ii) Gender Schema Theory
 - (iii) Cognitive Development Theory
 - (iv) Conflict Theory

2. SOCIAL CONSTRUCTION OF GENDER

- Social construction of gender during late childhood and adolescence
- Gender Identities and socialization practices in Family, School and other formal and informal organization.

Unit – II

3. EQUITY AND EQUALITY

- Concept of Equity and Equality: Psychological and sociological perspective
- Need and Importance of Gender Equality

4. GENDER INEQUALITIES AND STRATEGIES FOR CHANGE

- Gender Inequality in School: School curriculum, Text book, & classroom process.
- Initiatives of Govt. and Non-Govt. organization in dealing with gender inequalities with respect to society.

Practicum/Sessionals

Any one of the following

- i. Identify at least two students (Boys/Girls) having gender bias attitude and develop strategies for gender sensitization.
- ii. Analysis of selected ideas, trends, and problems in the study of gender across academic disciplines.
- iii. Survey on Gender Equality-Status of women and girls in the family and community.
- iv. Preparing sensitization material and creating awareness on Gender issues with the help of students in a village.
- v. Poster making on Gender Equality and Empowerment.
- vi. Observation of practice of inequality between male and female students in a rural school and report writing.

Suggested readings:

Bordia, A. (2007). *Education for gender equity: The Lok Jumbish experience*, p 313-329

Chatterji, S. A. (1993). *The Indian Women in perspective*, New Delhi: Vikas Publishing

Devendra, K. (1994). *Changing status of women in India*, New Delhi: Vikas Publishing House

Gupta, A. K. (1986). *Women and Society*, New Delhi: Sterling Publications

Ministry of Education (1959). *Report of National Committee of Women's Education*. New Delhi: ME

Ruhela, S. (1988). *Understanding the Indian Women today*; Delhi: Indian Publishers Distributors

Thakur, H. K. (1988). *Women and Development planning* (Case study of Nauhatta Block), New Delhi: Vikas Publishing House

Course-6 & 7 (807)

Group-I: Pedagogy of Sciences

(i) PEDAGOGY OF SCIENCE

Course Code : 807

Max. Marks :100

Time: 3 Hours

(Theory: 80,Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.**
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short -answer type Questions of 4 marks each to be selected from the entire syllabus.**
- iii. Two long answer type question will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.**

Course Outcomes

After completion of this course the students teacher will be able to:

- 807.1** Understand the concept of Science and get acquainted with Aims and objectives of Teaching Science.
- 807.2** Understand bloom's taxonomy of objectives and table of specifications.
- 807.3** Perform pedagogical analysis of various concepts in teaching Schience.
- 807.4** Develop skills of teaching and lesson planning.
- 807.5** Understand the principles of curriculum constructions and critical analysis of text book.
- 807.6** Manage science laboratories.
- 807.7** Familiarize with various approaches and methods of teaching of Science.
- 807.8** Understand the concept of continuous and comprehensive evaluation.

COURSE CONTENTS

UNIT – I

1. NATURE & SCOPE OF SCIENCE

- Meaning, Nature and Scope with reference to Science & its branches.
- History of science and contribution of Indian Scientists.
- Need & importance Science in secondary school & its values in the present context.
- Correlation of science with other school subjects
- Aims & objectives of Science.
- Bloom's Taxonomy of instructional objectives.
- Science in the service of human welfare – Agriculture, Medicine, Industry & Conservation of Environment.

UNIT – II

2. PEDAGOGICAL ANALYSIS & LESSON PLANNING

- Content –
 - Matter in our Surroundings
 - Atom & Molecules
 - Motion
 - Force
 - Gravitation
 - Work and Energy
 - Tissues
 - Diversity in Living Organism
 - Life Process
 - Reproduction
 - Micro-organism
- **Pedagogical Analysis :**
Following points should be followed for pedagogical analysis on topics covered in the syllabus
 - a)Identification of concept b)Listing behavioural outcomes c)Listing activities and experiments d)Listing evaluation techniques
- **Teaching Skills:-**
 - Skill of Introducing the Lesson
 - Skill of Illustrate with the help of Examples
 - Skill of Explaining
 - Skill of Stimulus Variation
 - Skill of Black-Board Writing
- Concept, Need & Importance of Unit Planning & Lesson Planning

UNIT – III

3. TEACHING LEARNING RESOURCES & PROCEDURES

- Meaning, Principles & Steps of Curriculum construction in Science
- Critical Analysis of Present Secondary School Text-Book with Reference to Haryana State
- Science Laboratory – Importance, Planning, Designing, Equipping, Maintenance of Science equipment & Records

- Audio-Visual Aids: Chart, Models, Film Strip, Radio, Projectors.
- E-learning Resources – Use of Multimedia & Computers, PPT, Internet, Website, Teleconferences.
- Improvised Apparatus – Meaning, Importance & Steps
- Professional Growth of Science Teacher in Service Programme, Orientation Programme, Refresher Courses, Seminars, Symposium, Workshop, Science Fair, Science Exhibition, Projects.

UNIT – IV

4. APPROACHES AND EVALUATION IN TEACHING

- Science Inductive – deductive Approach, Critical Inquiry Approach, Maier's Problem Solving Approach.
- Methods of Teaching Science
 - Lecture-cum-Demonstration
 - Project Method
 - Laboratory Method
- Continuous & Comprehensive Evaluation (CCE) in Science
- Construction & Use of Achievement Test in Science
- Construction & Use of Diagnostic Test in Science, Preparation of Diagnostic Chart, Identification of Difficulties & Remedial Teaching.
- Meaning & Advantages of Task Analysis and Question Bank.

Praticum/Sessional

Any one of the following

- i. Development of Five Demonstration Experiments on the Topics Covered in the Syllabus from Science Test-books at the Lower Secondary Level in Haryana State.
- ii. Improvisation of Apparatus/Equipment
- iii. Seminar Presentation on any Topics given in the Syllabus.
- iv. Celebration of science week in a village school and report writing
- v. Conducting a survey on health concerns in a village

Suggested Readings

Adams, G.S. (1964). Measurement & Evaluation in Education, Psychology & Guidance, New York: Halt, Rinehart & Winston.

Aggarwal, J.C. (2005). Essential of Examination System. New Delhi: Vikas Publishing HousePvt. Ltd.

Allen, D.W. and Eve, A.W. (1968). Micro Teaching in Theory to Practices. Vol. 70, pp. 181-185.

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Bloom, B.S. et al. (1956). Taxonomy of Educational Objectives: The Cognitive Domain, New York: Longum's Green.

CBSE (2009). Teacher Manual on CCE. New Delhi: CBSE.

Das, R.C. (1985). Science Teaching in Schools, New Delhi. Sterling Publication Private Ltd.,

Harrow, A.J.A. (1972). Taxonomy of Motor Domain, New York: Mckay.

Kherwadkal, Anjali (2003). Teaching of Chemistry by Modern Method, New Delhi Sarup & Sons..

Kilpatrick, W.H. (1987). The Project Method, Columbia. Teachers College Record.

Krathwohl, D.R., Bloom, B.S. and Maria, B.B. (1964). Taxonomy of Educational Objectives, Hand-book II, Affective Domain, New York: David Mckay.

Mager, R.F. (1962). Preparing Instructional Objectives, California: Fearon.

Miller, David F. and Blaydes (1962). Methods & Materials for Teaching Biological Science, New York McGraw Hill Book Co.,

Sharma, R.C. (1995). Modern Science & Teaching, New Delhi.

Dhanpat Rai & Sons. Siddique and SIdique (1998), Teaching of Science, New Delhi. DoabaHouse,

Vishwanth, Pandey and Kisor Valicha (1984). Science Technology & Development, New Delhi: McMillan India Ltd.

Venkataih, S. (2001). Science Education in 21st Century, New Delhi Anmol Publishers,.

Wadhwa, Shalni (2001). Modern Methods of Teaching Physics. New Delhi: Saroop & Sons.

Course-6 & 7 (808)

Group-I: Pedagogy of Sciences

(ii) PEDAGOGY OF BIOLOGICAL SCIENCE

Course Code : 808

Max. Marks :100

Time: 3 Hours

(Theory: 80,Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short – answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type question will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes(Cos)

After completion of this course the students teacher will be able to :

- 808.1** Understand Nature & Scope of Biological Science
- 808.2** Understand objectives of Teaching biological Science
- 808.3** Perform pedagogical analysis of various topics of biological Science.
- 808.4** Develop a skill of lesson planning based on various approaches.
- 808.5** Understand the principles of curriculum construction.
- 808.6** Apply e-resources in teaching biological science.
- 808.7** Adopt suitable approaches, methods, different resources to teach biological science.
- 808.8** Understand the concept of continuous and comprehensive evaluation.

COURSE CONTENTS

UNIT – I

1. NATURE AND SCOPE OF BIOLOGICAL SCIENCE

- Meaning, Nature and Scope with reference to Biological science and its branches.
- History of Biological science and contribution of Indian Biologist.

- Need and Importance of Biological in secondary schools and its values in the present context.
- Correlation of Biological science with other school subject.
- Aims and Objectives of Teaching Biological science.
- Bloom's Taxonomy of educational objectives.
- Formulation of specific objectives in Behavioural terms.
- Biology in the service of human welfare-Agriculture, Medicine, Industry & Conservation of Environment.

UNIT – II

2 PEDAGOGICAL ANALYSIS & LESSON PLANNING

- **Content**
 - Tissues
 - Diversity in living organism
 - Diseases
 - Natural Resources
 - Improvement in Food
 - Life Process
 - Reproduction
 - Heredity
 - Control and Co-ordination
 - Micro-organism
 - Photosynthesis
- **Pedagogical Analysis :** Following points should be followed for pedagogical analysis on topics covered in the syllabus
 - (a) Identification of concept
 - (b) Listing behavioural outcomes
 - (c) Listing activities and experiments
 - (d) Listing evaluation techniques.
- **Teaching Skills**
 - Skill of introducing the lesson
 - Skill of illustrate with the help of examples.
 - Skill of explaining
 - Skill of stimulus variation
 - Skill of using black board
- Concept, Need and Importance of unit planning and lesson planning.

UNIT – III

1. TEACHING LEARNING RESOURCES AND PROCESSES

- Meaning, Principles and steps of curriculum construction in biological science.
- Critical Analysis of Present secondary school text book with reference to Haryana State.
- Biological science Laboratory. Importance, Planning, Designing, equipping, maintenance of biological equipment and records.
- Visual Aids: - Chart, Model, Specimen.

- E-learning Resources: Use of Multimedia and Computers in biological science, e-learning, PPT, Internet, Website, Teleconferencing.
- Professional growth of biological science teacher in service programme, orientation programme, refresher courses, seminar, symposium, workshop, projects, science museum, science fair and science exhibition.

UNIT – IV

2. APPROACHES AND EVALUATION IN TEACHING

- Approaches of Teaching biological science.
 - Inductive – deductive approach
 - Critical inquiry approach
 - Maier's Problem solving approach
- Methods of Teaching biological science;
 - Lecture cum demonstration method
 - Project Method
 - Laboratory method
- Continuous and Comprehensive Evaluation (CCE) in biological science.
- Construction and use of achievement test in Biological Science.
- Construct and Use of diagnostic Test in Biological science, preparation of diagnostic chart, identification of difficulties and remedial teaching.
- Task Analysis, meaning and advantages
- Question Bank, meaning and advantages

Praticum/Sessional

Any one of the following

- i. Prepare a working model on Biological secondary school standard topics.
- ii. Collect and preserve any five biological specimen and write a report
- iii. Critically analyse secondary school state syllabus science text-book.
- iv. Preparation of Biological science wall magazine in every month
- v. A case study of any senior secondary lab and prepare report
- vi. Visit a farm to study and participate in organic farming operations.
- vii. Waste audit and composting to learn the important aspects of resource conservation activity.
- viii. Water audit and budgeting with water harvesting to learn the important aspects of conservation activity.
- ix. A survey report on garbage disposal practices in a village.
- x. Seminar/presentation on any topic given in the syllabus

Suggested Readings:

Adams G.S., (1964). *Measurement and evaluation in education, psychology and guidance*, New York : Halt, Rinehart and Winston.

Aggarwal, J.C. (2005). *Essentials of examination system*. New Delhi : Vikas Publishing

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Ameetha P (2004). *Methods of Teaching Biological Science*. New Delhi :Neelkamal Publications,

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Das, R.C. (1985). *Science teaching in schools*. New Delhi: Sterling Publication Private Ltd.

Green T.N. (1971). *Teaching of Biology in tropical schools*, Oxford University Press London.

Harrow, A.J.A. (1972); *Taxonomy of Motor Domain*, New York : McKay.

Karmer, L.M.J. (1975). *Teaching of Life Science*, McMillan India Ltd. New Delhi.

Kilpatrick, W.H. (1918); *the project method*, Columbia: Teachers College Record.

Krathwohl, D.R., Bloom B.S. and Maria B.B. (1964) *Taxonomy of Educational objectives, Handbook II, Affective Domain*, New York : David McKay.

Mager, R.F. (1962); *Preparing Instructional objectives*, California : Fearon.

Miller, David F. and Blaydes (1962); *Methods and materials for teaching Biological Science*, M.C. Grow Hill Book Co; New York.

Sharma, R.C. (1995). *Modern Science & Teaching*, Dhanpat Rai and Sons, New Delhi.

Sood J.K. (1987). *Teaching of Life Science*, Kholi Publisher, Chandigarh.

Vishwanth, Pandeny & Kishore, Valicha (1984). *Science Technology and Development*, Mc Millan Indian Ltd. New Delhi.

Course-6 & 7 (809)

Group-I: Pedagogy of Sciences

(iii) PEDAGOGY OF COMPUTER SCIENCE

Course Code : 809

Time: 3 Hours

Max. Marks: 100

(Theory: 80, Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q.No. 1 will be compulsory and will carry 16 marks. There will be four short -answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type questions will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

CourseOutcomes(COs)

After the transaction of the course, student teachers will be able to:

- 809.1** Emphasize the need and importance of computer science and acquaint with the aims and objectives of teaching computer science in secondary schools.
- 809.2** Understand Bloom taxonomy of objectives and table of specification.
- 809.3** Perform Pedagogical Analysis of various concepts in computer science.
- 809.4** Develop teaching skills and skill of lesson and unit planning.
- 809.5** Understand the principles of curriculum construction and importance of computer textbook.
- 809.6** Acquire the skill of managing a computer laboratory and use of E-resources .
- 809.7** Familiarize with the various methods that can be employed for the teaching of computer science.
- 809.8** Develop competencies for effective evaluation in computer science and visualize various plans to promote digital technology among rural community.

COURSE CONTENT

Unit-I

1 Nature and Scope of Computer Science

- Meaning, Nature and Scope of Computer Science.
- Significance of Computer Science in school curriculum.
- Correlation of Computer Science at different stages of school.

- Aims and Objectives of Teaching Computer Science at different stages of school.
- Blooms Taxonomy of educational objectives.
- Formulation of specific objectives in behavioural terms.

Unit-II

2 **Content, Pedagogical Analysis and Teaching Skills:** Concept, need and importance of Pedagogical Analysis.

- **Content:**

- Computer System
- Computer Software
- Networking
- MS-Windows
- MS-Office
- Operating System

- **Pedagogical Analysis:**

Following point should be followed for pedagogical analysis:-

- a) Identification of concept.
- b) Enlisting behavioural outcomes.
- c) Enlisting activities and experiments.
- d) Enlisting evaluation techniques.

- **Teaching Skills**

- Skill of Introducing the lesson
- Skill of Probing Questions
- Skill of Stimulus Variations
- Skill of Explaining

- **Lesson Planning:** Concept, Need and Importance of lesson planning and Unit planning.

Unit-III

3 **Teaching Learning Resources and Processes**

- Development and designing of computer science curriculum.
- Critical analysis of computer textbook.
- Development of self- instructional material
- Designing and managing a Computer Laboratory.
- E-learning Resources: Use of Multimedia e-learning, PPT, Internet.
- Qualities of a good Computer Science Teacher. And professional growth of Computer Science Teacher

Unit-IV

4 **Approaches and Evaluation**

- **Teaching Methods:**

- Lecture-cum-Demonstration method.
- Project method.
- Computer Assisted Instruction method.
- Laboratory Method.
- Mobile learning, and Online learning

- **Evaluation**

- Meaning and importance of evaluation
- Types and techniques
- Achievement Test
- Characteristics of a good test in Computer Science.
- Preparing, reporting and evaluating the results.
- Comprehensive and Continuous Evaluation.

Practicum/ Sessional

Do Any one of the following:

- i. Critical analysis of course content of Computer science of secondary school curriculum.
- ii. Prepare an achievement test of course content of Computer science of secondary school curriculum.
- iii. Internet based project: Form a group on internet and share educational information with atleast one link to audio/video material and prepare the project using ppt.
- iv. Power Point Presentation on Gandhian ideas and thoughts.
- v. Generating awareness regarding Digital India Initiative among rural community.

Suggested Readings

Agarwal J. C. (2006). *Essential of educational technology, Teaching and learning*. New Delhi: Vikas Publishing House Pvt. Ltd.

Sharma, R. A. (2008). *Technological foundation of education*. Meerut: R.Lall Books Depot.

Sharma, R. N. (2008). *Principles and Techniques of Education*. Delhi: Surjeet Publications.

Singh, Arjinder. *Teaching of Computer Education*. Jalandhar: Modern Publisher

Sinha, P.K. & Sinha, P. *Computer Fundamentals*, BPB

Singh, Y. K. (2009). *Teaching Practice*. New Delhi: APH Publishing Corporation

Course-6 & 7 (810)

Group-I: Pedagogy of Sciences

(iv) PEDAGOGY OF HOME SCIENCE

Course Code : 810

Max. Marks :100

Time: 3 Hours

(Theory: 80,Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short -answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type question will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes(COs)

After completion of this course the students teacher will be able to :

- 810.1** Understand Nature & Scope of Home Science and objectives of Teaching Home Science.
- 810.2** Understand bloom's taxonomy of educational objectives.
- 810.3** Develop skills of lesson planning based on various approaches.
- 810.4** Perform pedagogical analysis of various concepts of Home Science.
- 810.5** Understand the principles of curriculum construction.
- 810.6** Apply e resourcing in teaching Home Science and appreciate the importance of planning and organizing extension activities.
- 810.7** Adopt suitable approaches, methods, different resources to teach Home Science and examine the health status of school students of rural areas.
- 810.8** Understand the concept of continues and comprehensive evaluation.

COURSE CONTENT

UNIT – I

1 CONCEPT, OBJECTIVES AND IMPORTANCE

- Meaning, Nature and Scope of Home Science
- Need and Importance of Home science in secondary schools in the present context
- Correlation of Home Science with other school subjects
- Aims and objectives of teaching Home Science
- Blooms Taxonomy of educational objectives
- Formulation of specific objectives in Behavioural terms.

UNIT – II

2 CONTENT, PEDAGOGICAL ANALYSIS AND TEACHING SKILLS

- **Content**
 - Food, Nutrition and Health
 - Child Care
 - Fiber and Fabric
 - Home Management
 - Health and sanitation
- **Pedagogical Analysis :**

Following points should be followed for pedagogical analysis on topics

 - a) Identification of concept
 - b) Listing behavioural outcomes
 - c) Listing activities and experiments.
 - d) Listing evaluation techniques.
- **Teaching Skills**
 - Skill of introducing the lesson
 - Skill of illustrate with the help of examples.
 - Skill of explaining
 - Skill of stimulus variation
 - Skill of using black board
- **Concept, Need and Importance of unit planning and lesson planning.**

UNIT – III

3 TEACHING LEARNING RESOURCES AND PROCESSES

- Meaning, Principles and steps of curriculum construction in Home Sciences.
- Development and Characteristics of a good Textbooks. Critical analysis of current Home Science Text Books in secondary schools of Haryana State.
- Planning of space and equipment of Home Science Laboratory
- Classification and importance of Teaching Aids, (Visual Aids :- Chart, Model, Specimen).
- E-learning Resources: Use of Multimedia and Computers in Home Science, e-learning, PPT, Internet.

- Qualities of a good Home Science Teacher. Professional growth of Home Science Teacher

UNIT – IV

4 APPROACHES , METHODS AND EVALUATION IN TEACHING

- **Methods of Teaching:**
Lecture-cum- Demonstration; Project Method; Discussion Method; Practical and Individual Method
- **Activity Based Learning:**
Learning by doing : Experimentation; observation ; games, quiz; puzzles; Field visits and excursions
- **Approaches of Teaching Home Science :** Inductive – deductive approach ;Maier's Problem solving approach
- Continuous and Comprehensive Evaluation (CCE) in Home Science.
- Construction and use of achievement test and diagnostic test in Home Science.
- Task Analysis, meaning and advantages
- Question Bank, meaning and advantages

PRACTICUM/SESSIONALS:

Any one of the following:

- i. A course of ten practical by the Pupil-teacher in the following:
 - Cooking
 - Stitching/Embroidery/knitting
 - Home Management
- ii. Preparation of online test.
- iii. Preparation of objective type test, short answer type test, essay type test
- iv. Organize a quiz competition in Home Science and analyze the response of students
- v. Plan a field visit of Home Science students for studying and reporting the health habits and health concerns of school students of village.
- vi. Prepare one remedial Teaching Programme for a Home Science student
- vii. Writing of project report in extension education.
- viii. Organise a handicrafts fair in a village.

SUGGESTED READING

Chandra, Shah & Joshi. *Fundamental of Teaching of Home Science*, New Delhi: Sterling Publishers Pvt. Ltd

Dass & Ray. *Teaching of Home Science*, New Delhi: Sterling Publishers Pvt. Ltd

Devdass, R. P. *Method of Teaching of Home Science*, New Delhi: NCERT.

Devdass, R. P. *Teaching of Home Science in Secondary School*. A handbook of Suggestion for Teachers, New Delhi: NCERT

Spafford, I. *Fundamental in Teaching of Home Science*, New York: John Wiley & Sons

CBSE (2009); *Teacher's manual on CCE*. New Delhi : CBSE

Course-6 & 7 (811)

Group-I: Pedagogy of Sciences

(v) PEDAGOGY OF PHYSICAL SCIENCE

Course Code : 811

Max. Marks :100

Time: 3 Hours

(Theory: 80,Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short -answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type questions will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes(COs)

After completion of this course the student teacher will be able to :

- 811.1** Understand the Nature & Scope of Physical Science.
- 811.2** Understand Aims and objectives of Teaching Physical Science and describe the role of Physical Science in service of human welfare and its correlation with other school subjects.
- 811.3** Provide empirical knowledge about content analysis and pedagogical analysis.
- 811.4** Acquaint about effective teaching aids and teaching skills for well execution of
- 811.5** Visualize different innovative teaching learning resources and processes for professional growth.
- 811.6** Design and manage a physical science laboratory.
- 811.7** Adapt suitable approaches, methods and different resources to teach physical science.
- 811.8** Become aware about various approaches of teaching Physical Science and comprehensive evaluation.

COURSE CONTENTS

UNIT – I

1 NATURE AND SCOPE OF PHYSICAL SCIENCE

- Meaning, Nature and Scope with reference to Physical Science & its branches.
- History of Physical science and contribution of Indian Scientists in the field of Physics & Chemistry.
- Need & importance Physical Science in secondary school & its values in the present context.
- Correlation of Physical science with other school subjects.

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- Aim & objectives of Physical Science.
- Bloom's Taxonomy of instructional objectives.
- Physical Science in the service of human welfare – Agriculture, Medicine, Industry & Conservation of Environment.

UNIT – II

2 PEDAGOGICAL ANALYSIS & LESSON PLANNING

- Content –
 - Matter in our Surroundings
 - Atom & Molecules
 - Motion
 - Force & Law of Motion
 - Gravitation
 - Work and Energy
 - Sound
 - Acid Bases & Salt
 - Metal & Non-metal
 - Light
 - Electricity
- **Pedagogical Analysis** – Following points should be used for Pedagogical Analysis.
Following points should be followed for pedagogical analysis on topics covered in the syllabus
- a)Identification of concept b)Listing behavioural outcomes c)Listing activities and experiments, d)Listing evaluation techniques
 - Concept, Need & Importance of Unit Planning & Lesson Planning
- Teaching Skills:-
 - Skill of Introducing the Lesson
 - Skill of Illustrate with the help of Examples
 - Skill of Explaining
 - Skill of Stimulus Variation
 - Skill of Black-Board Writing

UNIT – III

3 TEACHING LEARNING RESOURCES AND PROCESSES

- Meaning, Principles & Steps of Curriculum construction in Physical Science
- Critical Analysis of Present Secondary School Text-Book with Reference to Haryana State
 - Physical Science Laboratory – Importance, Planning, Designing, Equipping, Maintenance of Physical Science equipment & Records
 - Audio-Visual Aids: Chart, Models, Film Strip, Radio, Projectors.
 - E-learning Resources – Use of Multimedia & Computers, PPT, Internet, Website, Teleconferences.
 - Improvised Apparatus – Meaning, Importance & Steps
 - Professional Growth of Physical Science Teacher in Service Programme, Orientation Programme, Refresher Courses, Seminars, Symposium, Workshop, Science Fair, Science Exhibition, Projects.

UNIT – IV

4 APPROACHES AND EVALUATION IN TEACHING

- Physical Science Inductive – deductive Approach, Critical Inquiry Approach, Maier's Problem Solving Approach.
- Methods of Teaching Physical Science
 - Lecture-cum-Demonstration
 - Project Method
 - Laboratory Method
- Continuous & Comprehensive Evaluation (CCE) in Physical Science
- Construction & Use of Achievement Test in Physical Science

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- Construction & Use of Diagnostic Test in Physical Science, Preparation of Diagnostic Chart, Identification of Difficulties & Remedial Teaching.
- Meaning & Advantages of Task Analysis and Question Bank.

Praticum/Sessional

Any one of the following

- i. Development of Five Demonstration Experiments on the Topics Covered in the Syllabus from Physical Science Test-books at the Lower Secondary Level in Haryana State.
- ii. Improvisation of Apparatus/Equipment
- iii. Seminar Presentation on any Topics given in the Syllabus.

Suggested Readings

Adams, G.S. (1964). *Measurement & Evaluation in Education, Psychology & Guidance*, New York: Halt, Rinehart & Winston.

Aggarwal, J.C. (2005). *Essential of Examination System*. New Delhi: Vikas Publishing House Pvt. Ltd.

Allen, D.W. and Eve, A.W. (1968). *Micro Teaching in Theory to Practices*. Vol. 70, pp. 181-185.

Bloom, B.S. et al. (1956). *Taxonomy of Educational Objectives: The Cognitive Domain*. New York: Longum's Green.

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Das, R.C. (1985). *Science Teaching in Schools*, New Delhi: Sterling Publication Private Ltd.

Harrow, A.J.A. (1972). *Taxonomy of Motor Domain*, New York: Mckay.

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Kilpatrick, W.H. (1987). *The Project Method*, Columbia. Teachers College Record.

Krathwohl, D.R., Bloom, B.S. and Maria, B.B. (1964). *Taxonomy of Educational Objectives, Hand-book II, Affective Domain*, New York: David Mckay.

Mager, R.F. (1962). *Preparing Instructional Objectives*, California: Fearon.

Miller, David F. and Blaydes (1962). *Methods & Materials for Teaching Biological Science*, New York: McGraw Hill Book Co.

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Vishwanth, Pandey and Kisor Valicha (1984). *Science Technology & Development*, New Delhi: McMillan India Ltd.

Venkataih, S. (2001). *Science Education in 21st Century*, New Delhi: Anmol Publishers.

Wadhwa, Shalni (2001). *Modern Methods of Teaching Physics*. New Delhi: Saroop & Sons.

<http://www.scienceworld.wolfram.com/physics.html>.

<http://www.nobel.se/physics/laureates.html>.

Course-6 & 7 (812)

Group-II: Pedagogy of Social-Sciences

(i) PEDAGOGY OF SOCIAL SCIENCE

Course Code : 812

Time: 3 Hours

Max. Marks: 100
(Theory: 80, Internal: 20)

NOTE FOR PAPER SETTER

- i) Paper setters will set 9 questions in all, out of which students will be required to attempt 5 questions.**
- ii) Q. No. 1 will be compulsory and will carry 16 marks. There will be 4 short-answer type questions of 4 marks each to be selected from the entire syllabus.**
- iii) Two long answer type questions will be set from each of the four units, out of which the students will be required to attempt one question from each unit. Long-answer type questions will carry 16 marks each.**

Course Outcomes(COs)

After completion of this course the student –teachers will be able to:

- 812.1** Elaborate the concept, nature and scope of social science.
- 812.2** Establish correlation of social science within or with other school subjects and life situations.
- 812.3** Get acquainted with the procedures of skills and pedagogical analysis for social science teaching.
- 812.4** Prepare lesson plans by applying knowledge of planning.
- 812.5** Explain the essentials of curriculum and text books of social science
- 812.6** Select and develop the support material required for designing learning experiences.
- 812.7** Develop an understating of methods and approaches of teaching social science.
- 812.8** Acquire competencies in preparing tools of evaluation social science learning.

COURSE CONTENTS

UNIT 1

1. Nature & Scope of Teaching of Social Science

- Meaning, Nature and Scope of Social Sciences as a school subject.
- Aims and Objectives of teaching Social Sciences at School level.
- Values of Teaching Social Sciences
- Taxonomy and behavioural Objectives in Social Sciences.
- Relationship of Social Science with other subjects and within the subject.

- Understanding terminology of Social Sciences: Social structure, social stratification, community, state, region, market

UNIT-2

2. **Pedagogical Analysis and lesson planning**

- Meaning and importance of pedagogical analysis
- Points followed for pedagogical analysis: (i) Identification of concept (ii) Listing behavioural outcomes (iii) Listing activities & Experiments (iv) Listing evaluation techniques.
- Some content for pedagogical analysis:
 - Constitution of India
 - Physical features of India
 - Indian Freedom Movement
 - Population
 - Democracy in the contemporary world
 - Disaster Management
- Skills of teaching Social Sciences: Skill of Introducing, Skill of Illustration with Examples, Skill of Reinforcement, Skill of Questioning and Skill of Stimulus Variation
- Lesson planning in Social Sciences: Need & Importance, Basic Elements & its Preparation

UNIT 3

3. **Teaching learning resources and process**

- Meaning, Importance and Principles of designing a good Curriculum of Social Sciences; Critical Appraisal of the Existing Curriculum in Social Sciences, Suggestions for improvement; Approaches of organizing social sciences curriculum- logical, concentric, spiral, chronological.
- Teaching Learning Material: Textbook & Reference Books, Documentaries, News Papers, Maps, Community, Atlas, and E-resources (Blog, World Wide Web, and Social Networking.)
- Social Science Club- Meaning, Importance and Organization(Club activities, Exhibitions, Field Trips, Quiz Competitions)

UNIT 4

4. **Approaches and Evaluation in Teaching**

- Classroom Processes: Discovery method, Discussion method, Source method, Survey Method, and Story Telling.
- Meaning, Importance and Types of Evaluation in Social Sciences.
- New approaches to Assessment – Question bank, Open Book Examination, Grading & Credit System.
- Construction of Achievement Test – Concept and Steps.

Praticum/Sessional

Any one of the following:

- i. Explore how cartoons, stamps, currency, magazines, globes and so on be used in teaching of social science.

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- ii. Make an Observation and prepare a list of places of historical interest/monument nearer to your residence and prepare a report on it.
- iii. Conduct a quiz competition in the class on a day of national importance and prepare a report of the same.
- iv. Prepare an action plan for social science club.
- v. Prepare a list 10 of books/Journals in social sciences with all bibliographic details for purchasing to the classroom library.
- vi. Draw different types of maps of World, India, and locality /Create a comparative timeline of events in India and world of Modern age.
- vii. Prepare a sample of Different Types of Test items on different objectives or Select a concept in Social Science prepare a diagnostic test
- viii. Prepare a sample of Content analysis, instructional objectives, Learning Activity, Learning Experience of a Topic from standard 6th or 10th.

Suggested Readings

Agarwal, J.C. (1993). *Teaching of Social Studies- A Practical Approach*, Second Revised Edition, Vikas Publishing House.

Batra, P.(ed) (2010) *Social Science Learning in Schools: Perspective and Challenges*, New Delhi, Sage

Dhamija, N. (1993). *Multimedia Approaches in Teaching Social Studies*, New Delhi: Harman Publishing House

Eklavya (1994) *Samajik Adhyayan Shikshan: Ek Prayog*, Hoshangabad: Eklavya.

George, A. and Madan, A.(2009) *Teaching Social Science in Schools*, NCERT's New Textbook, New Delhi: Sage

Gupta Rainu (2013) *Teaching of Social Science*, New Delhi, Doaba Publications.

Gupta Rainu (2012) *Samajik Vigyan Shikshan*, New Delhi :Doaba Publications.

Khan, S. U. (1998). *History Teaching-Problems: Prospective and Prospect*, New Delhi: Heera Publications

Kochhar, S.K.(1998). *Teaching of Social Studies*, New Delhi: Sterling Publishers Pvt, Ltd New Delhi.

NCERT (2006). *Position Paper National Focus Group on Teaching of Social Sciences*, New Delhi: NCERT

NCERT Social Science Textbooks for classes VI-X, New Delhi: NCERT.

Course-6 & 7 (813)

Group-II: Pedagogy of Social-Sciences

(ii) PEDAGOGY OF COMMERCE

Course Code : 813

Time: 3 Hours

Max. Marks: 100

(Theory: 80, Internal: 20)

NOTE FOR PAPER SETTER

- i) Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii) Q.No 1 will be compulsory and will carry 16 marks. There will be four short -answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii) Two long answer type question will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes(COs)

After completion of this course the student-teachers will be able to:

- 813.1** Understand the nature of Commerce and its relationship with other disciplines.
- 813.2** Comprehend the Bloom Taxonomy of objectives and write the Instructional objectives in behavioral terms.
- 813.3** Prepare Pedagogical analysis of the content and develop lesson plans for classroom teaching.
- 813.4** Acquire competencies in teaching skills.
- 813.5** Analyses the Curriculum and Textbook of Commerce.
- 813.6** Make effective utilization of Teaching Learning resources.
- 813.7** Get familiar with the methods of teaching and Evaluation.
- 813.8** Equip themselves in Evaluation techniques and construction of Achievement test.

Course content

UNIT-I

1. Concept of Commerce and Instructional Objectives

- Meaning nature and scope of Accountancy and Business studies.
- Need and Importance of Commerce in school curriculum at higher secondary level

- Aims, Objectives and Values of teaching Commerce.
- Blooms Taxonomy of Objectives (statement of objectives in behavioural terms).
- Relationship of Commerce with other Disciplines: Economics, Law, Mathematics, Sociology, Psychology, Statistics.

UNIT-II

2. Pedagogical Analysis and lesson planning

- Pedagogical Analysis: Identification of concept, Listing behavioural outcomes, Listing activities and experiments, Listing evaluation techniques.
- Content for Pedagogical Analysis:
 - Final A/Cs
 - Sources of Business finance.
 - Marketing Mix.
 - Social Responsibility of Business
 - Consumer protection
 - E-commerce
- Skills in Teaching
 - Skill of Introducing
 - Skill of Explaining
 - Skill of Probing Questions
 - Skills of Illustrating with examples
 - Skill of Stimulus variation
- Development of lesson plan: Utility, steps in lesson planning, qualities of a good lesson plan

UNIT-III

3. Teaching learning resources and Processes

- Commerce curriculum: Principles followed in development of commerce curriculum. Critical appraisal of the existing curriculum in Commerce. Suggestion for improvement
- Analysis of prescribed text- book of commerce (XI & XII)
- Teaching learning resources: Meaning, Importance and use of Teaching learning resources
- Traditional Instructional Material: Charts , Graphs and Specimens
- Mass media: Television , Newspaper , Journals
- E- resources: Blog , World wide Web , Social Networking

UNIT-IV

4. Approaches and Evaluation in teaching

- Methods of teaching:
 - Lecture cum Discussion Method
 - Project Method
 - E-Tutoring
 - Role playing
- Evaluation: Meaning, Importance , Types and Techniques.
- Preparation of Blue print and construction of Achievement Test

Practicum/ Sessionals

Any two of the following:

- i. Participation in discussion (class level) in any recent development in the area of commerce and prepare a report
- ii. Make a report on activities performed by a company regarding its social responsibility
- iii. Review at least two research articles on commerce
- iv. Make a report of E-Commerce operations of a company
- v. Field visit to any one (bank , factory , consumer forum).Prepare a report on functions performed

Suggested Readings

- Bruce, J.M and Roger Ottewill (2001). *Effective learning & teaching in business and management*. London: Routledge
- Chopra, H.K and Sharma, H. (2007). *Teaching of Commerce*, Kalyani Publishers Ludhiana
- Dalal, D.C and Dalal V.C (2008). *Teaching of Commerce* (Hindi Version). Patiala: Twenty First Century Publications
- Gupta Rainu (2009). *Teaching of Commerce* New Delhi, Shipra Publications
- Kaur, Ravdeep (2012). *Teaching of Commerce* Gurusar Sadhar: GBD Publications
- Kumar, Mahesh (2004). *Modern Teaching of Commerce*. New Delhi: Anmol Publications Pvt. Ltd.
- Monga Vinty (2009). *Teaching of Commerce Patiala*: Twenty first century publications
- Peter Davies, Jacek Brant (2006). *Business, Economics and enterprises*: Teaching School Subjects 11-19. London: Kogan Rage
- Rao Seema (2002). *Teaching of Commerce*, New Delhi: Anmol Publicatons Pvt. Ltd.
- Shankar T. (2007). *Methods of Teaching of Commerce*, New Delhi: Crecent VII

Course-6 & 7 (814)

Group-II: Pedagogy of Social-Sciences

(iii) PEDAGOGY OF ECONOMICS

Course Code : 814

Time: 3 Hours

Max. Marks: 100

(Theory: 80, Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short -answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type questions will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes (COs)

After completion of this course the student –teachers will be able to:

- 814.1** Understand the meaning nature and scope of teaching Economics and its relationship with other disciplines..
- 814.2** Comprehend the Bloom Taxonomy of objectives and write the instructional objectives in behavioral terms.
- 814.3** Prepare pedagogical analysis of the content and develop lesson plans for class room teaching.
- 814.4** Acquire competence in skills for the teaching of Economy.
- 814.5** Analyse the curriculum and textbook of teaching of Economics.
- 814.6** Develop teaching learning material and organize co-curricular activities through the Economics club..
- 814.7** Understand the different methods and approaches of teaching Economics.
- 814.8** Acquire competencies in preparing tools of Evaluation.

COURSE CONTENT

Unit -I

1. NATURE & SCOPE OF TEACHING OF ECONOMICS

- Meaning, Nature and Scope of Economics as a school subject.

- Aims and Objectives of teaching Economics at School level
- Values of Teaching Economics in present scenario.
- Taxonomy and behavioural Objectives in Economics.
- Correlation of Economics with Public Finance, Commerce, Law, Geography, Mathematics, Natural Science and Sociology.
- Understanding terminology of Economics: Micro Economics, Macro Economics, Market, Production, Business Economics and Budgeting.

Unit- II

2. PEDAGOGICAL ANALYSIS AND LESSON PLANNING

- Meaning and Importance of Pedagogical Analysis.
- Content :
 - Poverty as Challenge facing India
 - Indian economy
 - Globalization
 - Inflation & Deflation
 - Employment

- **Pedagogical Analysis :**

Following points should be followed for pedagogical analysis on topics:

- a) Identification of concept
 - b) Listing behavioral outcomes
 - c) Listing activities and experiments.
 - d) Listing evaluation techniques.
- lesson planning in Economics: Need & Importance, Basic Elements & its Preparation
 - Skills of teaching Economics: Skill of Explaining. Skill of Illustration with Examples, Skill of Probing Questions and Skill of Stimulus Variation.

Unit-III

3. TEACHING LEARNING RESOURCES AND PROCESS

- Meaning, Importance and Principles of designing a good Curriculum of Economics, Critical Appraisal of the Existing Curriculum in Economics, Suggestions for improvement. Approaches of organizing the curriculum of Economics.
- Meaning & Importance of Co-curricular activities. Economics Club – Meaning, Importance and Organization.
- Teaching Learning Material: Textbook & Reference Books, Documentaries, Graphs, Tables, News Papers, Library and E-resources (Blog, World Wide Web, and Social Networking.)

Unit-IV

4. APPROACHES AND EVALUATION IN TEACHING

- Teaching Economics through Discussion method, Project method, Problem-solving, Dramatization, Survey and Field visit.
- Meaning, Importance and Types of Evaluation in Economics.

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- Continuous and Comprehensive Evaluation: Meaning, importance & Process.
Construction of Achievement Test – Concept and Steps.

Practicum/Sessional

Any one of the following:

- i. Explore how cartoons, advertisements, graphs, currency, pictures can be used for teaching Economics.
- ii. Content Analysis and preparation of instructional material related to any unit
- iii. Prepare ten (10) slides related to economics teaching content at senior secondary level.
- iv. Critical appraisal of economics text books at senior secondary level.
- v. Field Visits (Banks, Small-Scale Industries, Consumer Cells)

Course-6 & 7 Pedagogy of Teaching Subjects (815)

Group-II: Pedagogy of Social-Sciences

(iv) COURSE-6 & 7 PEDAGOGY OF HISTORY

Time: 3 Hours

Max. Marks :100
(Theory: 80,Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short - answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type question will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes(COs)

After transaction of the course, student teachers will be able to:

- 815.1** Explain the concept, nature and scope of teaching history.
- 815.2** Understand the aims and objectives of History and establish correlation of History with other school subjects and life situations.
- 815.3** Perform Pedagogical analysis of various topics in History at Secondary level.
- 815.4** Get acquainted with the procedures of lesson plan.
- 815.5** Critically evaluate existing curriculum, syllabus and text-books.
- 815.6** Prepare, select and utilize different instructional materials.
- 815.7** Apply appropriate methods and techniques of teaching at different levels.
- 815.8** Acquire competencies in preparing tools of evaluation for teaching of History.

COURSE CONTENT

UNIT – I

1. NATURE, SCOPE, AIMS, AND OBJECTIVES OF HISTORY

- Meaning, Nature, Scope of history. Importance of time & space in history
- Place of history in secondary and senior secondary level school curriculum
- Aims, objectives and values of teaching history
- Bloom's taxonomy to formulate objectives in behavioural terms
- Co-relation of history with other school subjects. Relation of history with present.
- Classification of history according to geographical boundaries, period and circumstances.

UNIT – II

2. PEDAGOGICAL ANALYSIS OF CONTENT AND LESSON PLANNING

- Meaning and importance of pedagogical analysis

- Points followed for pedagogical analysis: (i) Identification of concept (ii) Listing behavioural outcomes (iii) Listing activities & Experiments (iv) Listing evaluation techniques.
- Some content for pedagogical analysis:
 - a) Indus valley civilization b) Ashoka The Great c) Mughal dynasty
 - d) First war of independence (1857 A.D.) , e) Freedom movement and modern India
- Lesson planning: Need and importance, steps involved in lesson planning, features of a good lesson planning.

UNIT – III

3. **TEACHING-LEARNING RESOURCES AND HELPING MATERIALS**

- Curriculum and instructional material: Need for development and designing curriculum in history.
- Principles of curriculum construction, organization of content in history curriculum according to stages of education.
- Development of history text-book, characteristics of a good text book, need of text-book for teaching history.
- Identifying controversial points of history, analytical teaching of such points.
- Meaning, importance and use of helping material, types of helping material
- Selection of helping material: Maps, time lines, flow charts, battle plans, pictures, film-strips, models, computer & internet, radio, T.V. etc.

UNIT – IV

4. **APPROACHES AND EVALUATION**

- Approaches, methods and techniques of teaching history – need and importance, selection of method to teach specific content.
- Various methods of teaching history: source method, discussion method, lecture-cum-story telling method, dramatization, project method, teaching through field trips and excursions.
- Meaning, objectives and importance of evaluation
- Evaluation techniques and devices, characteristics of a good test in history.
- Preparing, reporting and evaluating the results.

Practicum/ Sessionals

Any one of the following

- i. Preparation of time line, flow chart, battle plan, map showing boundaries of any specific dynasty or king or specific period (Individual activity)
- ii. Organize trip to historical place/monuments.
- iii. Prepare skit/drama from history-events / **life history of Mahatma Gandhi** (Group-activity)

Suggested Readings:

Chaudhary, K.P. (1975). The effective teaching of History in India. New Delhi: NCERT.

Dhamija, N. (1993). Multimedia Approaches in teaching of Social studies. New Delhi: Harman Publishing House.

Khan, S.U. (1998). History teaching problems, prospectives & prospect. New Delhi: Heera.

Gunnin, D. (1978). The teaching of History. London: Goom Helm Ltd.

Course-6 & 7 Pedagogy of Teaching Subjects (816)

Group II: Pedagogy of Social Sciences

(v) COURSE-6 & 7 PEDAGOGY OF GEOGRAPHY

Time: 3 Hours

Max. Marks: 100
(Theory: 80, Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short -answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type questions will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes(COs)

After completion of the course the student teacher will be able to:

- | | |
|--------------|--|
| 816.1 | Explain the concept, nature and scope of teaching Geography. |
| 816.2 | Understand the aims and objectives of teaching Geography |
| 816.3 | Perform Pedagogical analysis of various topics in Geography at Secondary level. |
| 816.4 | Get acquainted with the procedures of lesson plan. |
| 816.5 | Critically evaluate existing curriculum, syllabus and text-books. |
| 816.6 | Prepare, select and utilize different instructional materials. |
| 816.7 | Apply appropriate methods and techniques of teaching at different levels. |
| 816.8 | Acquire competencies in preparing tools of evaluation for teaching of Geography. |

COURSE CONTENT

Unit-I

1. NATURE AND SCOPE OF TEACHING GEOGRAPHY

- Meaning, nature & scope of Geography.
- Importance of teaching geography as school subject.
- Aims and objective of Teaching Geography at School Level.
- Bloom's taxonomy of objectives.

Unit-II

2. PEDAGOGICAL ANALYSIS AND LESSON PLANNING

- Meaning and importance of pedagogical analysis

- Points followed for pedagogical analysis: (i) Identification of concept (ii) Listing behavioural outcomes (iii) Listing activities & Experiments (iv) Listing evaluation techniques.
- Some content for pedagogical analysis:
 - Latitudes & longitudes
 - Rotation & Revolution
 - Agents of denudation
 - Physical Division of India
 - Cash crops of India
- Development of lesson plan

Unit-III

3. DEVELOPMENT OF INSTRUCTIONAL MATERIAL

- Development and designing of curriculum
- Development of text books
- Development of self-instructional material
 - Self instructional modules
 - P.L. materials (Linear style) packages
- Development of instructional aids-Maps, atlas, Globes, Charts, Graphs, Models, Film Strips, Film Shades, Utilizaation of T.V., Video OHP, Computer
- Designing geography laboratory.

Unit-IV

4. APPROACHES & EVALUATION IN TEACHING

- Various methods used – Discovery Method, Discussion method, Problem Solving, Concept Mapping , Project, Laboratory, Story Telling, Concept Attainment Model, Inquiry Training Model.
- Meaning, Importance and Types of Evaluation in Geography
- New approaches to Assessment - Question bank, Open Book, Examination, Grading & Credit System.
- Construction of Achievement Test – Concept and Steps.

Practicum/Sessionals

Any one of the following:

- i. Make an Observation of a place of Geographical interest of your locality and prepare a report on it.
- ii. Conduct a quiz competition on Geographical questions in class.
- iii. Prepare a list of 10 books/Journals in Geography with all bibliographic details for purchasing in the library/prepare a Text Book Material for a Particular Topic.
- iv. Draw different types of maps of World, India and locality.
- v. Prepare a sample of different types of test items on different objectives/Select a concept in Geography prepare a diagnostic test.
- vi. Prepare a sample Content analysis/ Prepare instructional objectives/Learning Activity/Learning Experience of a Topic from standard 6th to 10th.

SUGGESTED READINGS:

- Arora, K.I (1976). The Teaching of Geography, Jalandhar: Prakash Brothers.
- David B. (1985). New Directions in Geography Education, London: Fehur Press
- David, H. (1976). Geography and Geography Teacher, London: Unwin Education Books
- Graves, N.G. (1982). New Source book for Geography Teaching, Longman: UNESCO
- Huckle, J. (1983). Geographical Education Reflection and Action, London: Oxford, University Press
- Mohd, Z.U. (1984). Tadress Jugratia, Taraqqi Urdu Board New Source Book for Teaching of Geography UNESCO.
- Morrey, D.C. (1972). Basic Geography, London: Hien manns Education Book Ltd.
- Neelam D. (1993). Multimedia, Approaches in Teaching Social Studies, New Delhi: Human Publishing House
- Verma, J.P. (1960). Bhugol Adhyhan, Agra: Vinod Pustak Mandir
- Verma, O.P. (1984). Geography Teaching , New Delhi: Sterling Publication Ltd.
- Walford R. (1981). Signposts for Geography Teaching, London: Longman

Course-6 & 7 (817)

Group-II: Pedagogy of Social-Sciences

(vi) PEDAGOGY OF ART

Time: 3 Hours

Max. Marks: 100

(Theory: 80, Internal: 20)

NOTE FOR PAPER SETTER

- iv. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- v. Q.No 1 will be compulsory and will carry 16 marks. There will be four short -answer type Questions of 4 marks each to be selected from the entire syllabus.
- vi. Two long answer type questions will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 817.1** Understand meaning the nature of Art and its relationship with other school subjects.
- 817.2** Understand aims, objectives & bloom's taxonomy of instructional objectives.
- 817.3** Analyse the content pedagogically
- 817.4** Develop the lesson plan and skills.
- 817.5** Analyse the elements, principles and curriculum of Art.
- 817.6** Acquaint with the various teaching learning resources and methods.
- 817.7** Select appropriate methods of teaching to teach Art.
- 817.8** Equip themselves with practices of evaluation.

COURSE CONTENT

Unit-I

NATURE & SCOPE OF TEACHING ART

- Meaning, Nature and Scope of teaching Art.
- Aims and Objectives of Teaching Art
- Importance of Art in Education
- Correlation of Art with other school subjects.
- Bloom's Taxonomy of Instructional objectives in Education

Unit-II

PEDAGOGICAL ANALYSIS AND LESSON PLANNING

- **Content**
 - Composition
 - Poster
 - Design
 - Collage
 - Still Life
 - Landscape
- **Pedagogical Analysis: Following points should be followed for pedagogical analysis**
 - a) Identification of concept
 - b) Listing behavioral outcomes
 - c) Listing activities & experiments
 - d) Listing evaluation techniques
- **Teaching Skills**
 - Skill of Art Appreciation
 - Skill of Observation
 - Skill of Imagination
 - Skill of Visual Communication
 - Skill of handling the colours, brushes
 - Skill of Art development in Child at different stages.
- Concept, Need and Importance of Lesson Planning.

Unit-III

TEACHING LEARNING RESOURCES AND PROCESSES

- Elements and Principles of Art.
- Meaning, Principles and steps of curriculum construction in Art.
- Preparation of Teaching aids.
- Application of ICT in teaching Art
- Recreational activities in Art
- Professional qualities of a good teacher in Art
- Organizing Art Exhibition and decorating the classroom.

Unit-IV

APPROACHES AND EVALUATION IN TEACHING

- **Methods of teaching art**
 - Lecture-cum-demonstration Method
 - Excursion Method
 - Project Method
 - Observation Method
- **Evaluation**
 - Meaning, Importance of evaluation

- Types of Evaluation
- Evaluation techniques
- Preparation of Blue print and construction of Achievement Test.

Practicum/Sessionals

Any one of the following:

- | | | |
|----------------|---|-------------------------------|
| 1. Composition | : | Human figures, Birds, animals |
| 2. Poster | : | Writing and Designing |
| 3. Still Life | : | Drawing & Painting |
| 4. Design | : | Alpna/ Rangoli |
| 5. Collage | | |
| 6. Landscape | | |

Suggested Readings

Gupta, Arvind (2003). *Kabad se Jugad: Little Science*. Bhopal: Eklavya.
Khanna, S. and NBT (1992). *Joy of Making Indian Toys, Popular Science*. New Delhi: NBT.
Prasad, Devi (1998). *Art as the Basis of Education*, New Delhi: NBT.,
Sahi, Jane and Sahi, R(2009). *Learning Through Art*, Eklavya,

Course-6 & 7 (818)

Group-II: Pedagogy of Social-Sciences

(vii) PEDAGOGY OF MUSIC

Time: 3 Hours

Max. Marks: 100

(Theory: 80, Internal: 20)

NOTE FOR PAPER SETTER

- vii. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.**
- viii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short -answer type Questions of 4 marks each to be selected from the entire syllabus.**
- ix. Two long answer type questions will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.**

Course Outcomes(COs)

After completion of the course the student teacher will be able to:

- 818.1** Understand the history, importance and co -relation of Music with other school subjects.
- 818.2** Comprehend the knowledge of swaras and sruti and Bloom's taxonomy of instructional objectives.
- 818.3** Prepare pedagogical analysis of the content and develop lesson plan for classroom teaching.
- 818.4** Acquire competence in skills for the teaching of Music.
- 818.5** Develop teaching aids to teach Music.
- 818.6** Familiarize the qualities of Music and Music teacher.
- 818.7** Understand the different methods of teaching Music.
- 818.8** Acquiring competency in preparing tools of evaluation.

COURSE CONTENT

Unit-I

1. NATURE & SCOPE OF MUSIC

- A brief history of Indian Music.
- Need and importance of Music in secondary schools.
- Aims & Objectives of teaching Music in schools

- Co-relation of Music with other school subjects.
- Knowledge of Swaras and Sruti
- Blooms taxonomy of Instructional objectives

Unit-II

2. PEDAGOGICAL ANALYSIS AND LESSON PLANNING

- **Content**
 - Swar
 - Saptak
 - Sruti
 - Rhythm
 - Taal
- **Pedagogical Analysis: Following points should be followed for pedagogical analysis:**
 - a) Identification of concept
 - b) Listing behavioral outcomes
 - c) Listing activities & experiments
 - d) Listing evaluation techniques
- **Teaching Skills**
 - Skill of Introducing the lesson
 - Skill of explaining
 - Skill of stimulus Variation
 - Skill of Questioning
- **Need & Importance of Lesson Plan in Music.**

Unit-III

3. TEACHING LEARNING RESOURCES AND PROCESSES

- Information about voice culture and Carny's
- Possibilities of Notation for Indian Music.
- Motion and Rhythm in Music
- Importance of various Teaching Aids in Music.
- Qualities of Music Teachers: Gayak, Vadyak and Vadyakar.
- Importance of classical Music and suggestions for the popularization of classical Music.

Unit-IV

4. APPROACHES AND EVALUATION IN TEACHING

- **Methods of teaching Music**
 - Play way method
 - Heuristic method
 - Lecture-cum-Demonstration
 - Geet Method
 - Project Method
- **Evaluation**
 - Meaning, importance and types of evaluation in Music
 - Types of Evaluation techniques in Music
 - Preparation of Blue print and construction of Achievement test.

Practicum/Sessionals

Any Two of the following :

- Every Candidate should be able to sing a fast Khyal or play a rezakhoni Gat with Tanas and Alaps or Jhala and Toras in each of the following Ragas: Bhupali, Bhairvi, Brindavani Sarag, Asawari, Bhimplashi, Malkauns, Kaffi.
- Every candidate should be able to sing or play a slow Khal (Vilambit Bara Khyal) or Masti Khyal Gat in Asawari and Malkauns Rag.
-
- The following Tals are required to be practiced in. Tha's and Dvigun Laya on Table: Teen Tal, Dadra, Juptal, Dharva, Ektal
-
- Tuning of the instrument for the instrument player and tuning of the Janpura for vocal music students.
- Candidate shall be able to read, write music notation either of Bhatkhande or Vishnu Digamber Pulskar.

SUGGESTED READINGS

Awasthis. *Teaching of Music(Hindi)*, Extension Services, Jalandhar: Govt. Training College
Bhatnagar, S Teaching of Music
Goswami, O. Indian Music
Khande B. Short Historical Survey
Khanna, J.: Teaching of Music
Masan, P.L. Teaching of Music, (Hindi).
Patwardhan, rag Vigvan
Ranaday. Indian Music (Its Physical and Aesthetics)\
Sambamoorthy, P. Teaching of Music

Course-6 & 7 (819)

Group-III: Pedagogy of Languages

(i) PEDAGOGY OF ENGLISH

Course Code : 819

Max. Marks :100

Time: 3 Hours

(Theory: 80,Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.**
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short -answer type Questions of 4 marks each to be selected from the entire syllabus.**
- iii. Two long answer type questions will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.**

Course Outcomes

After transaction of the course, student teachers will be able to:

- 819.1** Familiarize with the concept, nature and scope of English language.
- 819.2** Comprehend aims and objectives.
- 819.3** Conduct pedagogical analysis of the content in English language and develop linguistic skills among their pupils.
- 819.4** Provide familiarization with Micro teaching skills for teaching/learning English.
- 819.5** Make effective use of instructional resources in pedagogy of English.
- 819.6** Become acquainted with different teaching learning resources of English.
- 819.7** Develop insight into different methods and approaches in teaching English.
- 819.8** Equip themselves in preparing tools of evaluation in English learning.

Course Content

Unit-1

1. Nature, Scope and Concept of Language

- Importance of teaching English at National and International Scenario.
- Social history of English language Teaching in India

- Aims and objectives of teaching English
- Taxonomy and behavioral objectives in English.

Unit-II

2. Development of Linguistic Skills, Pedagogical analysis and lesson planning

- Strategies for developing language skills : Listening and Speaking.
- Developing Reading Skills & reading comprehension: Intensive and Extensive Reading, silent and loud reading.
- Developing Writing Skills: Characteristics and Techniques for improvement.
- Meaning and importance of pedagogical analysis.
- Points followed for pedagogical analysis : (i) Identification of concept (ii) Listing behavioral outcomes (iii) Listing activities and experiments (iv) Listing evaluation techniques.
- Pedagogical analysis of Prose, Poetry, Grammar, Composition: Objectives and Lesson Planning.
- Skill of teaching English : Skill of introducing, Illustration with examples, Reinforcement, Questioning & Stimulus Variation.

Unit-III

3. Teaching Learning Resources & Processes

- Qualities of a good teacher of English.
- Text books : Characteristic of a good text book.
- Teaching grammar – Deductive and Inductive Approach.
- Co-curricular activities in English classroom : Language games, quiz, debates, group discussions.
- Importance of Instructional material and their effective use : 1. Charts, 2. Pictures, 3. Chalk board 4. Models, 5. Real Objects, 6. Use of ICT including internet.

Unit-IV

4. Development of Professional Efficiency & Evaluation Techniques

- Methods and Approaches of Teaching: Direct, Bilingual, Interactive Communicative Approach, Co-operative learning approach.
- Difference between measurement and evaluation
- Meaning and significance of Comprehensive and continuous evaluation in English.
- Development of good test items in English (Objective- type, essay - type and short answer type).

Practicum/Sessional

Any one of the following:

- i. Preparation of Diagnostic Test, Achievement Test and reading comprehension test.
- ii. Preparation of Instructional Material:
 - a. Preparing PPT's
 - b. Preparation of Charts and Models
- iii. Prepare a Remedial programme for a child having English Spelling errors.
- iv. Collect Indian folktales and folklores and translate in English.
- v. Organise a workshop on improving communication skills of students in a rural school.

Suggested Readings

- Bansal, R.K. and Harrison, J.B. (1972) : *Spoken English for Indian*, Madras: Orient Longman Ltd.
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- Brumfit, C.J. (1984): *Communicative Methodology in Language Teaching* . Cambridge: C.U.P.
- Chadha, S.C. (2004). *Arts and Science of Teaching English* (2nd ed.). Meerut : Surya Publication .
- Freeman D.L. (2000). *Techniques and Principles in Language Teaching* ,Oxford: CUP.
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- Rai, Geeta (2009). *Teaching of English*, Meerut : Vinay Rakheja
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- Sharma, Praveen (2008). *Teaching of English Language*, Delhi : Shipra Publications.
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Course-6 & 7

Group-III: Pedagogy of Languages

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le;%3 ?k.Vs

(Theory: 80, Internal- 20)

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- fglh f'k'k . k eaulj d uRed fdz kvs'k n v l r'k l i nlg v l r'k l i ngydk dk vk ; ktuA
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Course-6 & 7 (821)

Group-III: Pedagogy of Languages

(iii) PEDAGOGY OF PUNJABI

Course Code : 821

Time: 3 Hours

Max. Marks: 100

(Theory: 80, Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short -answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type question will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 821.1** Understand the nature of Punjabi and its relationship with other languages (Hindi, English, Sanskrit).
- 821.2** Comprehend the Bloom Taxonomy of objectives and write the Instructional objectives in behavioral terms.
- 821.3** Prepare Pedagogical analysis of the content and develop lesson plans for classroom teaching/ instructional purposes.
- 821.4** Acquire competencies in language skills.
- 821.5** Analyses the Curriculum and Textbook of Punjabi.
- 821.6** Make effective utilization of Teaching Learning resources.
- 821.7** Describe different methods of teaching of Punjabi.
- 821.8** Explain the concept of evaluation and use of techniques of evaluation.

Course content

Unit -1

1. NATURE & SCOPE OF TEACHING OF PUNJABI

- Language & its development
 - Meaning
 - importance

- Nature
 - Formulation of Instructional objectives in teaching of Punjabi
- Meaning of Instructional objectives
- Taxonomy of Instructional objectives
- writing objectives in behavioral terms
 - Correlation
 - Inter correlation of Punjabi language with other languages(Hindi,English,Sanskrit)
 - Intra correlation of Punjabi language(Prose,Poetry,Grammar,Composition)

Unit- 2 PEDAGOGICAL ANALYSIS AND LESSON PLANNING

- **Pedagogical Analysis-** Following points should be followed for pedagogical analysis on topics
 - a) Identification of concept
 - b)Listing behavioural outcomes
 - c) Listing activities and experiments.
 - d) Listing evaluation techniques
- **Content**
 - Any two topics from Prose, Poetry and Grammar
- Teaching skills
 - Skill of Questioning
 - Skill of Explaining
 - Skill of Illustrating with examples
- Skill of chalk board writing
 - Concept, Need & Importance of Unit Planning & Lesson Planning

Unit-3

3. TEACHING LEARNING RESOURCES AND PROCESS

- Instructional Material
 - Concept
 - components
 - Importance / use
- Development of Language skills
 - Listening
 - speaking
 - Reading
 - Writing
- Use of Language laboratory and latest techniques
- Curriculum of Punjabi Language
- Text Books of Punjabi Language

Unit-IV

4. APPROACHES AND EVALUATION ON TEACHING

- Methodology :
 - Modern methods of teaching language with specific references to
 - (i) Project method
 - (ii) Play way method
 - (iii) Discussion method
 - (iv) Observation method
- Remedial Teaching
 - Meaning and significance of remedial teaching
 - Common errors in Punjabi language and their removal
- Evaluation
 - Concept of test measurement and evaluation
 - Place of Evaluation in the process of teaching learning

Practicum/Sessionals

Select anyone of the following:

- i. Preparation of a Diagnostic /Achievement Test.
- ii. Organize a quiz competition in Punjabi and analyze the responses of students.
- iii. ICT Based presentation on any topic of your choice.
- iv. Seminar presentation on any topic given in the syllabus.

Suggested Readings

- Singh, G.B.(1981). *Gurumukhi Lipi Da Janam Te Vikas*, Chandigarh: Punjab University Publication Bureau
- Singh, G.(1971). *Gurumukhi Lipi Bare*, Ludhinana : Lahore Book Shop
- Singh, H.(1966), *Punjabi Bare*, Patiala: Punjabi University
- Sekhon, S.S. & Singh, P.P.(1961). *Punjabi Boli Da Itihaas*, Punjabi Bhasha Vibhag

Course-6 & 7

Group-III: Pedagogy of Languages

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822-6- i k B; Øe fuek{k i k B; i qrd dh fo'k\$kr kvka dks ifj Hkkf"kr dj
I d xA

822-7- I hđr f'k{k.k dh fofHkUu fof/k; ka dk oxhZdj . k dj I d xA

822-8- ew; ka du ifØ; k ds fofHkUu ?k valka dk ifriknu dj I d xA

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- I ðdr Hkk"kk , oa l kfgR; dk egRo o bl dk vU; fo"k; ka l s vUr7 aakA
- I ðdr Hkk"kk dk vU; Hkk"kkvka l s l aakA
- vk/kfud i kB; Øe ea l ðdr dk LFkkuA
- f=Hkk"kk l = , oa vU; 'kkl dh; ifronuka dk l ðdr f'k{k.k ij i HkkoA
- I ðdr Hkk"kk dk fo'o Hkk"kkvka ds l kFk l gl EcU/k rFkk v/; ; u dh ikl fxdrrkA
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- I ðdr Hkk"kk dh foHkku fo/kkvka dk f'k{k.k

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- I ħdr x | f'k{k.k mīś;] egRo] i fØ; k , oa i k B ; kst uk
- I ħdr jpuk f'k{k.k mīś;] egRo] i fØ; k , oa i k B ; kst uk
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Course-6 & 7 (823)

Group-IV: Pedagogy of Mathematics

PEDAGOGY OF MATHEMATICS

Course Code : 823

Time: 3 Hours

Max. Marks: 100

(Theory: 80, Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setters will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q. No. 1 will be compulsory and will carry 16 marks. There will be four short-answer type questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type questions will be set from each of the four units, out of which the students will be required to attempt one question from each unit. Long-answer type questions will carry 16 marks each.
- iv. All questions will carry equal marks.

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 823.1** Understand the meaning, nature& scope of mathematics and its relationship with other school subjects.
- 823.2** Comprehend the bloom taxonomy and write instructional objectives in behavioral terms.
- 823.3** Get acquainted with the procedures of skills, pedagogical analysis and lesson plan.
- 823.4** Prepare lesson plans by applying knowledge of planning.
- 823.5** Acquire skills of analyzing curriculum and text books in mathematics.
- 823.6** Enable students to organize Co-curricular activities and develop teaching learning material through the mathematics club.
- 823.7** Select appropriate methods of teaching to teach mathematics
- 823.8** Acquire competency in preparing tools for evaluation.

COURSE CONTENT

Unit-I

1. NATURE & SCOPE OF TEACHING OF MATHEMATICS

- Meaning, nature and scope of mathematics

- History of Mathematics and Contribution of Indian mathematician with special reference to Bhaskaracharya, Aryabhatta and Ramanujam
- Relationship of Mathematics with other school subjects
- Aims and objectives of Mathematics teaching
- Behavioural objectives: meaning and importance of behavioural objectives, writing instructional objectives for teaching of mathematics (Bloom's Taxonomy of Instructional Objectives).

Unit-II

2. PEDAGOGICAL ANALYSIS AND LESSON PLANNING

- Meaning and importance of Pedagogical Analysis
- **Points followed for Pedagogical Analysis:**a) Identification of conceptb)listing behavioral outcome c) listing activity & experimentsd) listing evaluation techniques
- **Contents for Pedagogical Analysis:**
 - Arithmetic (Fractions, Ratio and Proportion,)
 - Algebra (Polynomials, Linear equations, Quadratic equations)
 - Geometry (Congruent and Similar triangles),
 - Trigonometry (t-ratios, Heights and Distances)
 - Menstruation (Areas, Surface areas and volumes of solid figures)
- Skills of teaching mathematics: Skill of Introduction, Skill of Questioning, Skill of Reinforcement, Skill of Illustration with examples and Skill of Stimulus variation
- Lesson planning:Need and importance, steps involved in lesson planning, features of a good lesson plan.

Unit-III

1. TEACHING LEARNING RESOURCES AND PROCESSES

- Meaning, Importance and Principles of designing a good curriculum of Mathematics
- Textbooks: Meaning and importance of textbooks in mathematics, qualities of a good textbook inMathematics
- Applications of ICT in teaching of mathematics
- Meaning and importance and preparation of audio-visual aids in teaching mathematics
- Problems in teaching and learning of mathematics
- Importance and organization of Mathematics Club
- Recreational activities of Mathematics Club
 - Quiz
 - Games
 - Puzzles
 - Mathematics exhibition

Unit-IV

2. APPROACHES AND EVALUATION IN TEACHING OF MATHEMATICS

- **Methods of teaching Mathematics**
 - Lecture cum demonstration method
 - Analytic-Synthetic
 - Laboratory
 - Inductive-Deductive

- Problem Solving
- Project Method
- **Techniques of teaching Mathematics**
 - Oral work
 - Written work
 - Drill work,
 - Home Assignment
- Evaluation: Meaning, importance and types of evaluation.
- Preparation of diagnostic and achievement test.

Practicum/Sessional

Any one of the following

- i. Critical study of mathematics text book of secondary school.
- ii. Prepare any one self-made teaching aid for teaching of Mathematics in secondary school
- iii. Prepare an achievement test of mathematics
- iv. Prepare a diagnostic tests of mathematics
- v. Prepare slides using MS Power point on any one topic of mathematics

Suggested Readings:

Aggarwal, J. C. (2008). *Teaching of mathematics*. UP: Vikas Publishing House Pvt Ltd.

Bagyanathan, D. (2007). *Teaching of mathematics*. Chennai: Tamil Nadu Text Book Society.

Bhatia, K. K. (2001). *Foundations of teaching learning process*. Ludhiana: Tandon

ICFAI. (2004). *Methodology of teaching mathematics*. Hyderabad: ICFAI University Press.

Ediger, M., & Bhaskara Rao, D. B. (2004). *Teaching mathematics successfully*. New Delhi: Discovery Publishing House.

Ediger, M., & Rao, D.B. (2000). *Teaching mathematics successfully*. New Delhi: Discovery Publishing House.

Goel, Amit. (2006). *Learn and teach mathematics*. Delhi: Authors Press.

ICFAI. (2004). *Methodology of teaching mathematics*. Hyderabad: ICFAI University Press.

James Anice (2005); *Teaching of Mathematics*, Neelkamal Publication.

Joyce., & Well., (2004). *Models of teaching*. U.K: Prentice hall of India.

Kapoor, S. K. (2006). *The teaching of vedic mathematics*. New Delhi: Lotus Press.

Course 8

KNOWLEDGE AND CURRICULUM

Course Code- 824

Max. Marks :100

Time: 3 Hours

(Theory: 80,Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short - answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type questions will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 824.1** Understand the concept, sources, types and terms such as : Information, reasoning belief, truth and analysis.
- 824.2** Analyze the thoughts of Great Educational thinkers.
- 824.3** Understand the Basic Concept of Society.
- 824.4** Describe the role of Economic, Cultural and Historical dimension of Education.
- 824.5** Understand the concept and dimension and curriculum at different levels.
- 824.6** Describe the determinants and basic consideration of curriculum development.
- 824.7** Examine the concerns and issues related to curriculum.
- 824.8** Critically analyses the concept, need and process of National Curriculum Framework.

Course Contents

Unit-I

1. Knowledge Basis of Education

- Concept, sources, types& Facets of Knowledge
- Distinction between information & knowledge, belief & truth and reasoning & analysis.

- Education and knowledge as visualized by different thinkers : Gandhi, Tagore, J. Krishnamurty Friedrich Frobel.

Unit-II

2. Social Basis of Education

- Basic concepts of Society: Socialization, Equity and Equality, Modernity with reference to industrialization, democracy.
- The role of culture, economy and historical forces in shaping the aims of education.
- Individual opportunity, social justice and dignity in context of democratic education.
- A study of Secularism, Nationalism and Universalism and their interrelationship with education.

Unit-III

3. Curriculum Development

- Concept of Curriculum and Syllabus: Dimensions of Curriculum and their relationship with aims of education.
- Curriculum at different levels- National, State and School.
- Determinants of curriculum: Philosophical, Psychological, Sociological, Political, Culture and Economic.
- Basic considerations in Curriculum Development.

Unit-IV

4. Curriculum Practices

- Teachers' experiences and concerns: Laboratory work, Library, Field Survey, Group Discussion.
- Nature of learner and learning process and subject matter.
- Knowledge and ideology in relation to curriculum and text books.

National curriculum framework: Concept need and process of development.

Practicum/ Sessionals

Any two of the following:

- i. Socio-economic educational survey of near by village/ urban settings.
- ii. Role of education in empowerment of weaker sections of society.
- iii. To analyze and prepare a report on the present curriculum of Haryana School Education Board/ CBSE in the light of various determinants of curriculum development.
- iv. Filed survey on impact of present system of education on:
 - a) Socialization of child
 - b) Modernization with reference to industrialization and individual autonomy.
- v. To survey and prepare a project report on how far the present system of education is able to inculcate secularism, nationalism, and universalism.
- vi. Blue Print of practice models of Gandhi ji /Tagore for rural reconstruction.

Suggested Readings

Butchvarov, P. (1970), *The Concept of Knowledge*, Evanston, Illinois: North Western University Press.

Chomsky, N (1986). *Knowledge of Language*, New York : Prager.

Cole Luella (1950). *A History of Education: Socrates to Montessori*, NewYork: Holt, Rinehart & Winston.

- Datta, D.M. (1972). *Six ways of Knowing*. Calcutta.: Calcutta University Press,
- Dewey, J.(1997.)My Pedagogic Creed', in D.J. Flinders and S.J. Thorton(eds.) *The Curriculum Studies Reader*, New York: Routledge.
- Dewey, J (1997) *Experience and Education*, Touchstone, New York
- Dewey, J (1956). *The Child and the Curriculum and School and Society*, University of Chicago Press, U.S.A. Chicago, Illinois.
- Krishna M. J. (1947) *On Education*, New Delhi: Orient Longman.
- Kumar K. (1996). *Learning From Conflict*, New Delhi: Orient Longman.
- Lakshmi, T.K.S. & Yadav M.S.(1992). Education: Its Evolving Characteristics, in *New Frontiers in Education*, Vol. XXII, No.4, Oct-Dec.
- Margaret, K.T.(1999.) *The open Classroom*, Orient Longman: New Delhi: Hirst. Paul, Knowledge and curriculum.
- Peters, R.S.(1967) *The Concept of Education*, UK: Routledge.
- Power, E, J., M (1962). *Currents in the History of Education*, New York. : McGraw Hill Book Co. Inc.
- Prema C. (2001). *Teaching & Learning: The Culture of pedagogy*, NewDelhi: Sage Publication.

Course -9 (825)
ASSESSMENT FOR LEARNING
Course Code-825

Time: 3 Hours

Max. Marks :100
(Theory: 80,Internal: 20)

NOTE FOR PAPER SETTER

- i. Paper setter will set nine questions in all, out of which students will be required to attempt five questions.
- ii. Q.No 1 will be compulsory and will carry 16 marks. There will be four short - answer type Questions of 4 marks each to be selected from the entire syllabus.
- iii. Two long answer type questions will be set from each of the four units, out of which the student will be required to attempt one question from each unit. Long- answer type questions will carry 16 marks each.

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 825.1** Understand the nature of assessment and evaluation purposes and objectives of assessment.
- 825.2** Understand the importance of current evaluation practices.
- 825.3** Get acquainted with Bloom's taxonomy objectives and table of specifications.
- 825.4** Understand achievement tests, diagnostic test and kinds of task and their importance in assessment.
- 825.5** Understand assessment process tools and construction of process oriented tools.
- 825.6** Acquire the knowledge of group dynamics and portfolio assessment.
- 825.7** Understand analysis, manage and implement assessment data.
- 825.8** Understand the role of feedback to stakeholders and reporting students performance.

Course Contents

Unit I

1. INTRODUCTION TO ASSESSMENT & EVALUATION

- Concept of Assessment & Evaluation and their inter relationships.
- Purposes and objectives of assessment for placement, providing feedbacks, grading promotion, certification, diagnostic of learning difficulties.
- Critical review of current evaluation practices:
 - a) Formative and summative evaluation
 - b) Prognostic and diagnostic
 - c) Norm referenced test and Criterion referenced test
 - d) Quantitative and Qualitative

Unit II

2. ASSESSMENT OF LEARNING

- Concept of Cognitive, Affective, Psychomotor domain of learning (Revised taxonomy of objectives (2001))
- Constructing table of specifications & writing different forms of questions – (VSA, SA, ET & objective type, situation based)
- Construction of achievement test- steps, procedure and uses
- Construction of diagnostic test – Steps, uses & limitation
- Kinds of task: projects, assignments, performances

Unit III

3. ASSESSMENT PROCESS & TOOLS

- Need for CCE its importance and problems faced by teachers
- Meaning & Construction of process-oriented tools – observation schedule; check-list; rating scale; anecdotal record;
- Assessment of group processes – Nature of group dynamics; Socio-metric techniques; steps for formation of groups, criteria for assessing tasks; Criteria for assessment of social skills in collaborative or cooperative learning situations.
- Portfolio assessment – meaning, scope & uses; developing & assessing portfolio; development of Rubrics.

Unit IV

4. CONSTRUCTION INTERPRETATION AND REPORTING OF STUDENT'S PERFORMANCE

- Interpreting student's performance :
 - a) Descriptive statistics (measures of central tendency & measures of variability, percentages)
 - b) Graphical representation (Histogram, Frequency Curves)
 - c) NPC – percentile.
 - d) Grading – Meaning, types, and its uses
- Role of feedback to stake holders (Students, Parents, Teachers) and to improve teaching – learning process; Identifying the strengths & weakness of learners.

Reporting student's performance – Progress reports, cumulative records, profiles and their uses, Portfolios.

Practicum/ Sessionals

Any one of the following:

- i. Construction of unit test, using table of specifications and administering it to target group and interpreting the result.
- ii. Construction of any one of the process oriented tools and administering it to group of students & interpreting it.

- iii. Analysis of question papers (teacher made)
- iv. Writing self appraisal/ create portfolio.
- v. Planning and organizing student's portfolio.
- vi. Writing a report on the evaluation and learner practice of school education.
- vii. Examine and reflect upon the problems and issues involved in assessment practice of school evaluation.
- viii. Activities and Assessment criteria for Work education and Experiential learning, Community service.

Suggested Readings

- Bransford, J., Brown, A.L., & Cocking, R.R. (Eds.). (2000). How people learn: Brain, mind, experience, and school. Washington, DC: National Academy Press.
- Burke, K. (2005). How to assess authentic learning (4th Ed.). Thousand Oaks, CA: Corwin.
- Burke, K., Fogarty, R., & Belgrad, S (2002). The portfolio connection: Student work linked to standards (2nd Ed.) Thousand Oaks, CA: Corwin.
- Carr, J.F., & Harris, D.E. (2001). Succeeding with standards: Linking curriculum, assessment, and action planning. Alexandria, VA: Association for Supervision and Curriculum Development.
- Danielson, C. (2002). Enhancing student achievement: A framework for school improvement. Alexandria, VA: Association for Supervision and Curriculum Development.
- Gentile, J.R. & Lalley, J.P. (2003). Standards and mastery learning: Aligning teaching and assessment so all children can learn. Thousand Oaks, CA: Corwin.
- Guskey, T.R., & Bailey, J.M. (2001). Developing grading and reporting systems for student learning. Thousand Oaks, CA. Corwin.
- Linn, Robert and Norman E Gronland (2000); Measurement and Assessment in teaching, 8th edition, by Prentice Hall, Inc, Pearson Education, Printed in USA.
- Natrajan V.and Kulshreshta SP(1983). Assessing non-Scholastic Aspects-Learners Behaviour, New Delhi: Association of Indian Universities.
- NCERT(1985). Curriculum and Evaluation, New Delhi:NCERT
- Newman, F.M. (1996). Authentic achievement: Restructuring schools for intellectual quality. San Francisco, CA: Jossey-Bass.
- Nitko, A.J. (2001). Educational assessment of students (3rd ed.). Upper Saddle River, NJ: Prentice Hall.
- Norris N.(1990) Understanding Educational Evaluation, Kogan Page Ltd.
- Rao, Manjula (1998): Training material on continuous and comprehensive evaluation (monograph) Mysore: Regional Institute of Education (NCERT).
- Rao, Manjula (2004): Evaluation in schools – a training package (monograph), Mysore: Regional Institute of Education (NCERT).
- Singh H.S.(1974) Modern Educational Testing. New Delhi: Sterling Publication.
- Ved Prakash, et.al. (2000): Grading in schools, NCERT, Published at the publication Division by the secretary, NCERT, New Delhi: Sri Aurobindo Marg.

Course 10 (826)

CREATING AN INCLUSIVE SCHOOL

Course Code-826

Max. Marks :50

Time: 1.30 Hours

(Theory: 40,Internal: 10)

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 8 marks. There will be two short - answer type Questions of 4 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 16 marks each.**

Course Outcomes(COs)

After the transaction of the course, student teachers will be able:

- 826.1** To define the concept of Disability, Inclusion, Psychosocial construct of disability and identity.
- 826.2** To analyze the policy and programme initiatives in the area of inclusion and barrier to learning.
- 826.3** To adopt appropriate teaching learning strategies and guidance and counselling strategies for inclusive practices.
- 826.4** To know and maintain the individualized education plan.

Course Contents

Unit I

1. Inclusive education:

- Meaning, nature, need and philosophy of inclusive education.
 - a) Models of inclusion,
 - b) Barriers to learning and participation.
 - c) Implementation and strategies for inclusion in society and school.
- Constitutional provisions-Govt. policies and practices:
 - a) National Policy of Persons with Disabilities Act 2006,
 - b) Sarva Shiksha Abhiyan in terms of Inclusive Education.
- Psycho-social and educational characteristics, functional limitations, role of family and community participation with reference to- Loco motor Impairment, Hearing Impairment, Visual Impairment, Learning Impairment and Mental retardation

Unit-II

2. Inclusive practices in classrooms

- School readiness and support services for inclusive education.
- Teacher competencies, role of class teachers and resource teachers in inclusive education.
- Guidance and counselling in inclusive education.
- Teaching learning strategies in inclusive education: co- operative learning, peer tutoring, social learning, multisensory learning.
- Individual Educational Programme (IEP) and use of emerging technologies.

Practicum/ Sessionals

Any one of the following:

- i. Preparation of status report on school education of children with diverse needs.
- ii. Evaluation of text books from the perspective of differently abled children.
- iii. Field visit to school/institutions promoting inclusive practices and discussion with teachers and observation and analysis of teaching learning practices.
- iv. Analysis of policy document (national, international) related to diversity.
- v. Planning and conducting multi level teaching in the local school.
- vi. Critical review of policy and practice and panel discussion by a group of students.
- vii. Make a list of existing resources in the local area and discuss their use and limitations based on survey of five inclusive schools.
- viii. Study of forms of inequities in the society, education, health, civic participation, social justice and gender.
- ix. Case study of a Child with Disability in a village

Suggested Readings

Alur Mithu and Michael Bach, (2009), *The Journey For Inclusive Education In The Indian Sub-Continent*. UK:Routledge

Dettmer, p., Dyck,N.and Thurston, L.P.(1999). Consultation collaboration and teamwork for students with special needs, Needham Heyats, M.a Allyn &Bacon

Epstein, C. (1984) *Special Children in Regular Classrooms*. Virginia: Reston Publishing Company, Inc

Frostig, M, and, P. Maslow (1973) *Learning Problems in the Classroom: Prevention and Remediation*. New York: Grune & Stratton.

Jorgensea, C.M.ed(1998). R restructuring High Schools for all Students: Taking inclusion to the next level, Baltimore: Paul H. brookes.

Hallahan, D & Kauffman, J.M. (1991). *Exceptional Children: Introduction to special Education*, Englewood, NJ: Prentice Hall.

COURSE 11 (Option-i) (827)

ENVIRONMENT EDUCATION

Course Code-827

Max. Marks :50

Time: 1.30 Hours

(Theory: 40,Internal: 10)

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 8 marks. There will be two short-answer type Questions of 4 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 16 marks each.

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

827.1 Understand the concept, need, scope and objectives of Environment Education.

827.2 Sensitize the Global Environmental problems and explain the different policies & Environmental legislation in India.

827.3 Explain the teaching learning strategies and Evaluation techniques in Environment education.

827.4 Familiarize with Curriculum development, Environmental disasters and Role of Media in Environment education.

Course Content

Unit-I

1. Concept of Environmental Education:

- Meaning, need and scope of environmental education.
- Evolution and development of environmental education.
- Stock Holm conference, Tbilisi conference and Earth Summit.
- Objectives of environmental education.

2. Environmental problems and policies:

- Acid rain, Ozone depletion, effect of urbanization, industrialization and deforestation.
- Global warming and Kyoto Conference.
- Pollution and its types.
- Policies related with environmental problems.

- Sustainable development
- Environmental legislation in India.
- Concept of healthy environment
- Eco club: Meaning, Characteristics & Importance.

Unit-II

3. Curriculum development and environmental education:

- Teaching learning strategies and evaluation techniques in environmental education.
- Planning of environmental education in school, colleges and Universities.
- Role of Media in environmental education.
- Curriculum development in Environment education.

4. Managing environmental disasters:

- Meaning, types, causes and effects of different disasters.
- Managing environmental disaster at community and individual level
- Rescue from disaster: Principles governing rescue, rescue process
- Relief for disaster: preparatory phase of relief, planning immediate relief, execution of relief.

Practicum/Sessionals

Any one of the following:

- i. Prepare a scrap file along with suggestion of pupil-teacher related to environmental articles and news.
- ii. Project report on local environmental problem.
- iii. Conducting discussion (class level) on disaster management and prepare a report on it.
- iv. Participating and promoting Vanamahotsav with school community participation a feast for creating awareness of trees and planting of saplings.
- v. On field learning: Raising a nursery/ Kitchen garden.
- vi. Organise activities of an eco club in a rural school

Suggested Readings:

- Ali Khan, S. & Sterling, (1998). *Sustainable development education: Teacher education specification*, London, Education for sustainable development Panel.
- Allaby, M. (1996). *Basics of Environmental Science*. New York: Routledge.
- Aptekar, Lewis (1914). *Environmental Disasters in Global perspective*. New York :G.K.Hall; Toronto: Maxwell macmillan.
- Burton, Ian, Robert W. Kares and Gilbert F. white (1993). *The environmental as Hazard*. New York: the Guildford press.
- Dani, H.M. (1996). *Environmental Education*. Chandigarh: Punjab University Publication Bureau.
- Huckle, J. & Sterling, S. (eds) (1996). *Education for sustainability*, London: Earthscan.
- Kaur, T.N. (1999). *Environmental Concerns & Strategies*, New Delhi: Ashish Publication House.
- Laeq Futehally (1994) *Our Environment*. India: National Book Trust
- Lambert, P.R. (2000). *Education for sustainable development : a new role for subject*

association, education in science ,208.pp.8-9

Pankaj Shrivastava & D.P. Singh (2002). *Environment Education*, Anmol publication Pvt. Ltd.

Pelling, Mark (ed.)(2003).*Natural Disasters & development in a globalizing world* . London: New York; Routledge.

Trivedi, P.R.(2000). *Encyclopedia of environmental Pollution Planning & Conservation*; New Delhi: A.P.H.Co.

Verma V.A. (1972). *Textbook of Plant Ecology*, Delhi: Euolcary Publication.

Warburton D.(ed.)(1998). *Community & Sustainable Development*, London, Earthscan.

Yogendra N.Srivastava (2012). *Environmental Pollution* . New Delhi: PPH Publishing Corporation.

Course-11 (option-ii) (828)
PEACE EDUCATION
Course Code-828

Max. Marks :50

Time: 1.30 Hours

(Theory: 40, Internal: 10)

NOTE FOR PAPER SETTER

- iv. Paper setter will set five questions in all, out of which students will be required to attempt three questions.
- v. Q.No 1 will be compulsory and will carry 8 marks. There will be two short - answer type Questions of 4 marks each to be selected from the entire syllabus.
- vi. Two long answer type question 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 16 marks each.

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 829.1** Understand the concept, need of peace education as a universal value.
- 829.2** Explain aim and objectives and role of social agencies in promoting peace education.
- 829.3** Understanding the philosophical thoughts and challenges to peace education.
- 829.4** Imbibe the knowledge, attitude and skills needed to achieve and sustain a global culture of peace.

Course Contents

Unit -1

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-2

2. Peace In The Indian Context

- Role of Religion in propagation of Peace. Mother-Theresa, 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.

References

Adams.D (Ed) (1997). *UNESCO and a culture of Peace: Promoting a Global Movement*.

Paris UNESCO.

Taj.H. (2005). *National Concerns and Education*, Neelkamal Publications.pvt.Ltd

Taj.H (2005). *Current challenges in Education*, Neelkamal Publications.pvt.Ltd

Bhargava.M. & Taj.H (2006). *Glimpses of Higher Education*. Agra-2: Rakhi Prakashan,

<http://www.un.org/cyberschoolbus/peace/content.html>.

Course-11(option-iii) (829)
HEALTH, PHYSICAL AND YOGA EDUCATION
Course Code-829

Time: 1.30 Hours

Max. Marks :50
(Theory: 40,Internal: 10)

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 8 marks. There will be two short - answer type Questions of 4 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 16 marks each.

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 828.1** Explain the concept of Health, Physical and Yoga Education along with their roles for a healthy Individual.
- 828.2** Explain the importance of Diet, food and nutrition.
- 828.3** Acquaint themselves with ways and means to deal with different types of diseases, pollution and Global Warming.
- 828.4** The importance of physical fitness and causes of postural deformities.

Course Contents

Unit-I

1. HEALTH ,YOGA AND 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, 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.
- First Aid in case of Wounds, Hammerages, Fracture, Dislocations, Sprain, Strain and Bites
- Health Hazards
- Pollution: Types, causes and prevention
- Water conservation, management and recycling
- Global warming
- Personal and Environmental Hygiene

4. POSTURE AND PHYSICAL FITNESS:

- Postural deformities and their Management through Yogic and other exercises
- Physical Fitness –Elements, importance.

Practicum/Sessionals

Any one of the following:

1. A) Prepare a Medical report of a school student.
B) Report of common first aid emergencies in school.
2. Performing & Reporting any five advance yoga asana.
3. Prepare a report on health awareness programme in school community.
4. Survey report on health status of students in a rural school
5. celebration of Yoga day/Yoga week.
6. Awareness programme to promote hygiene,sanitation in a nearby village.

References:

Anderson, C.R. *Your guide to health*.

Bucher, C.A. (1964) *Foundations of Physical Education*, New York: Mosby and company.

Catharine Ross Benjamin Caralleso, Robert, J. Cousino (2009). *Modern Nutrition in health and diseases*.

Holmes, A.C. *Health in developing countries*.

Kang Gurpreet singh & Deol NishanSingh.(2013). *An Introduction to Health and Physical Education*, 21st century publications, India.

Piper, B. (1999). *Diet and Nutrition: A guide for students and practitioners*.

COURSE 11 (Option-iv) (830)

GUIDANCE AND COUNSELLING

Course Code-830

Max. Marks :50

Time: 1.30 Hours

(Theory: 40,Internal: 10)

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 8 marks. There will be two short - answer type Questions of 4 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 16 marks each.

Course Outcomes(COs)

After transaction of the course, student teachers will be able to:

- 830.1** Explain the concept and different types of guidance..
- 830.2** Explain the concept of Counselling and its types.
- 830.3** Understand the testing and non-testing devices for the study of an Individual.
- 830.4** Familiarize with the different types of guidance services organized in the School.

Course Content

UNIT-I

1. INTRODUCTION TO GUIDANCE

- Meaning, Nature and Scope
- Principles of Guidance
- Types of Guidance : Educational, Vocational and Personal Guidance (Meaning, Need and Importance, Objectives)

2. COUNSELING

- Concept of Counselling, Need & Importance of Counselling
- Types of Counselling : Directive, Non-Directive and Eclectic
- Meaning and Characteristics
- Process of Counselling

UNIT-II

3. STUDYING AN INDIVIDUAL

- Need and importance of Studying an individual
- Testing and Non-testing devices for the study of an individual
- Testing : Interest Inventories and aptitude tests
- Non-Testing : Interview, Questionnaire Cumulative record card, Anecdotal record, Rating scale

4. GUIDANCE SERVICES AND THEIR ORGANIZATION IN THE SCHOOLS:

- Types of Guidance services
- Role of School personnel in organizing guidance services
- Role of Teacher as a counselor.

Practicum/Sessionals

Any one of the following

- i. Make a study of a guidance centre. Prepare a report.
- ii. Prepare a cumulative record card of a student studying at secondary level.
- iii. Prepare a report on the guidance services organized by school personnel.
- iv. Learning and participating in the world of work : Study of local occupations, technologies & skills and work force.
- v. Prepare a report on the guidance & counselling needs of Students with Disabilities in a rural school.

Suggested Readings:

Bhatia K.K (2002). *Principles of Guidance and counseling*, Ludhiana : Kalyani Publishers.

Gibren, R.h and Mitchell, M.H (2003). *Introduction to counseling and guidance*, New Delhi: Pearson Educaiton.

Pandey, K.P (2000). *Educational and Vocational Guidance in India*, Varanasi: Vishwa VidyalyayaPrakashan.

Robinson (2005). *Principles and Procedures in Students counseling*, New York : Harper & Row.

Sharma, R.A (2008). *Fundamental of Guidance and counseling*, Meerut: R Lall Book Depot.

Sidhu, H.S (2005). *Guidance and Counselling*, Patiala : Twenty First Century.

Strong, R. (2005). *Counselling Techniques in colleges and secondary school*. New York: Harper.

Course EPC-1 (831)

Reading and Reflecting on Text.

Max. Marks :50

(External: 25,Internal: 25)

Time: 3 Hours

Learning Outcomes

Course Outcomes(COs)

After the transaction of the course, student-teacher will be able to:

- 831.1** Able to explain different types of text.
- 831.2** Read and respond to a variety of texts in different ways: personal, creative & critical
- 831.3** Get involved in the readings interactively-individually and in small groups and enhance capacities as active readers and writers.
- 831.4** Comprehend and think reflectively on spoken or written texts.

COURSE CONTENT

Unit 1

1. Text and Reading

Types of Texts:

General: Literary or non-literary; Narrative, expository, technical & persuasive.

Education: Descriptive, conceptual, historical, policy documents, narrative texts, expository texts, ethnographies.

2. Text and Reflection

- Text structure, language, genre, context, socio-cultural diversity.
- Reflection in Reading: Pre-reading, Post-reading.
- Previews the text and make predictions, makes connections to personal experience or other texts, asks clarifying questions, identify difficult sentences or passages, restates in own words, reacts to the text by using language laboratory.

Unit 2

3. Communicative Reader-Interactive reading(Individual and groups)

Concept and relevance of communicative reader.

4. Expressive Reflections

- a) Concept of reflective writing
- b) Critical appreciation of the text: Note taking, critically reviewing the text.

Suggested Activities:

- i. Ways of reading: pre-reading and post reading
- ii. Read a book, a journal Article, or a chapter and write personal responses and summarize.
- iii. Prepare presentations on literary TEXT – Autobiography / ethnographic text.
- iv. Beyond the textbook: reading comprehension and question –answers.
- v. Preparing a Vocabulary Book (50 words), with Meanings and Usage.
- vi. Writing a book review and critically analyze the Content and Language of the text.
- vii. Make a list of reading books of diverse texts and classify them under headings.
- viii. Conduct interactive group reading session (small groups).
- ix. Narrating/describing a related account from one's life experience (in front of a smaller group).
- x. Discussion of characters and situations –sharing interpretations and points of view (in a smaller group).
- xi. Read a book and identify the text structure, language, genre, context, socio-cultural diversity.
- xii. Reading to extract overall meaning, information, subject knowledge (guided reading in pairs and simple note making).
- xiii. Explain the gist of the text/topic to others (in the larger subject group)
- xiv. Discussion of the theme, sharing responses and points of view (small group discussion).
- xv. Conduct debates/discussions, role-playing, dialogues on educational policies and documents on them by using language laboratory.
- xvi. Study and reflect on Biography of Gandhi ji..
- xvii. Studying and reporting health concerns/ drainage system of school/ village.
- xviii. Writing expenditure account for an activity/function and house hold family budget plan.

EPC-2 (832) **Drama and Art in Education**

Time: 3 Hours

Max. Marks :50
(External: 25,Internal: 25)

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 832.1** Develop imagination and sense of appreciation and aesthetic of art.
- 832.2** Have basic knowledge about colour schemes and prepare effective teaching aids.
- 832.3** Use drama processes to examine their skills.
- 832.4** Generate new knowledge, understanding and perceptions regarding household skills.

Course Content

Drawing and Painting

- Representational Drawing and painting from nature – plants, foliage, flowers, birds and animals etc. (medium – pencil, pen & ink, crayon, water-colour- any two medium)
- Perspective Drawing.
- Still-life study (medium – pencil, pen & ink, crayon, water colour, oil-colour, acrylic colour – any two medium).
- Composition Painting – (Crayon, Water-colour, Oil-colour – any two medium).
- Arrangement printing with leaf, finger, cork, stamps, cardboard, jute and bandage texture– any two medium.
- Monotype surface-printing, Thread-print, Stencil-print, spray-print, Simple block making and print – Potato-cut-print, vegetable print with lady finger, Simple block making and print – Potato-cut-print, vegetable print with lady finger, – any two medium.

Creative Art /Drama

- Creative pictorial or geometrical design – Water colour / Pastel colour.
- Surface design – Floor decoration (Alpana, Rangoli), Wall decoration.
- Poster-Design (Monochrome / multi-colour).
- Simple lettering for communication, calligraphy.
- developing narratives in visuals, composition of an imagined situation
- telling a story through comic strips, creating a collage using images, bits cut-out from old magazines, news paper etc.

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- Collecting and arranging rare photographs, photo print on various theme.
- Understanding the Drama as a medium of instructions and its role in effective teaching. It should be based on the lesson from particular subjects of teaching: One Act Play, Skit, Mono Acting, Voice Play, Storey Board etc. should be implemented as one of the effective teaching aid.
- The prospective teacher will prepare minimum TWO lessons through drama. The contents will be from or based on the lesson to teach in the class.
- Reflective report on curriculum of Art, Craft, Drama, Music and Theatre in schools.
- Tailoring, Stitching, Knitting and folk arts- Preparing samples.

Course EPC 3 (833)

Critical Understanding of ICT

Max. Marks :50

(External: 25,Internal: 25)

Time: 3 Hours

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 833.1** Interact with ICT and use effectively ICT tools and relevant software applications for specific purpose in teaching learning process.
- 833.2** Acquire knowledge of computers, its accessories and software.
- 833.3** Demonstrate the use of MS Windows and develop skill in using MS-Word, Power points and Spread sheets.
- 833.4** Acquire skill in accessing World Wide Web and Internet and global accessing of information and Organizing science and technology based activities for the community.

COURSE CONTENTS

1. ORIENTATION TO ICT

- **ICT:** Meaning, Importance and Tools of ICT
- **Computer Fundamentals:** Basic anatomy, types and applications, Input-Output devices, Storage devices.
- **MS-Windows:** Basic components of Windows, Control Panel, Program Manager, File Manager, Accessories, Paint Brush, notepad.
- **MS Word:** Concept of word processing, Entering Text, Selecting and Inserting text, editing text, Making paragraph, Getting help, moving and copying, searching and replacing, formatting character and paragraph, handling multiple documents, Manipulation of tables and foot notes, table of contents and index, sorting, formatting sections and documents.
- **MS Excel:** Basics of Spreadsheet, creating and saving a worksheet, Manipulation of cells, Columns and Rows, editing and formatting a worksheet, embedding charts, use of simple statistical functions, sort and filter.
- **MS Power point:** Basics of power point, creating a presentation, the slide manager, preparation of different types of slides, slide design, transition and animation and presentation of slides, printing the slides and handouts.
- **Multimedia:** Components of Multimedia, Textual Information, Animation, Digital Audio, Digital Video, MS-Publisher, Photo Draw.

2. DIGITAL SHARING AND EXCHANGE OF INFORMATION

- **Internet:** the world-wide web, websites and web browsers, Internet connectivity, browsing software, URL addresses, Search engines, Exploring websites and

downloading materials from websites, E- mail – Sending, receiving and storing mail, handle attachments, Chatting, social networks, participate in discussion forum and blogging.

3. ICT TOOLS AND ITS INTEGRATION IN EDUCATION

- Over-head Projector
- LCD Projector
- T.V.
- Camera
- Visualizer
- Interactive Boards
- CD/DVD Player

Hands On Training:

- i. Administrative use – Letter correspondence and E-Mail
- ii. Construction of a Portfolio and Question paper of teaching subjects
- iii. Creating learning materials – handouts
- iv. Data processing, storing and retrieving simple financial transactions of the school such as school budget and accounting.
- v. Tabulation of Bio data of staff and students of the school in which the student teacher is attached for practice teaching.
- vi. Students progress record – Tabulation and graphical representation of results of an academic test.
- vii. Multimedia presentation on a topic relevant to the Optional Subjects
- viii. Prepare transparencies on a topic relevant to the Optional Subjects.
- ix. Organizing science and technology based activities/services for the community and/or the locality.

A softcopy of above activities should be presented at the time of external examination.

Suggested Readings

1. Copestake, S. (2004). Excel 2002. New Delhi: Drem Tech Press.
2. Hahn, H. (1998). The internet- complete reference. New Delhi: Tata McGraw Hill Publication.
3. Intel Education & NCTE. (2007). Hand book for teacher educators. Bangalore: NCTE.
4. Leon, A. M. (2001). Computer for every one. New Delhi: Vikas Publishing house.
5. Petzold, C. (1998). Programming windows. USA: Microsoft Press.
6. Sundararajan, K. (1998). Internet. Chennai: Kannadhasan Publications.
7. Stone, E. (1996). How to use Microsoft Access. California: Emergyville.
8. Simon, C. (1995). The way microsoft windows 95 works. USA: Microsoft Press.
9. Srinivasan, T. M. (2002). Use of Computers and Multimedia in education. Jaipur: Aavisakar Publication.

EPC-4 (834)
Understanding the self

Max. Marks :50

(External: 25,Internal: 25)

Time: 3 Hours

Course Outcomes(COs)

After the transaction of the course, student teachers will be able to:

- 834.1** discover and knowing oneself and its significance.
- 834.2** reflect upon the effects of gender biasness, stereotyping and prejudice.
- 834.3** To evolve as a progressive, flexible and a reflective practitioner as a teacher.
- 834.4** equip student teachers with skills for empathetic listening and self expression.

Course Content

General Orientation

- Concept of self and self identity
- Exploring oneself: Self identity; Potential of self; fear; aspiration
- Factors affecting self identity: Social, Cultural, Gender, Religion & Language.
- Role of teacher as a facilitator in self exploration of pupil teacher.

Suggested Activities:-

- (i) Self expression through varied forms: Poetry, Aesthetic Representation (painting, Poster Making, sketch & Cartoon making)
- (ii) Critically evaluate oneself as a 'Prospective teacher' (Self Appraisal Report)
- (iii) Write a self reflective accounts of significant experiences concerning gender, stereotypes and prejudices.
- (iv) Role play and Paired activity for empathetic listening.
- (v) Critically reflects on one's teaching-learning practices.
- (vi) Yoga sessions
- (vii) Conducting workshop on following issues:
 - a) Self Awareness
 - b) Self Identity
 - c) Sharing life turning incidents
 - d) Meditation workshop
 - e) Gender biasness
 - f) Stereotyping and prejudice
 - g) Marginalization
 - h) Role of media in dealing with above issues.
- (viii) Case study of Happiness, Pleasure and Non-violence in school/ classrooms.

Suggested Readings:

Brooksfield, S.d.(1995). Becoming a critically reflective teacher. San Francisco. CA:John Wiley & Sons.

Duval. T.S., & Silvia, P.J(2001). Self awareness and causal attribution: A dual systems theory. Boston: Kluwer Academic.

Phillips, A.g., & Silvia. P .J. (2002). Self- awareness, self evaluation and creativity.

COURSE-13 (837-853)

**School Internship Programme (SIP)
&
Engagement with the Field (EWF)**

Duration

B.Ed. - Ist Year:	SIP- 1 Week EWF- 3 Weeks
B.Ed.- IInd Year:	SIP- 14 Weeks EWF- 2 Weeks

Course Outcomes(COs)

- 837.1-853.1** To undertake the field activities pertaining to the theories and practicals subjects.
837.2-853.2 To develop an understanding about various components of school Administration
837.3-853.3 To recognise feelings, diagnose needs and fears, and improve one's abilities
837.4-853.4 To learn and practice new skills and techniques for effective outputs in job market for teachers.
837.5-853.5 To acquaint the students with specific problems of school management and get exposed to Professional etiquettes to make a lasting impression.
837.6-853.6 To write a reflective journal on observation of regular class room teaching with respect to pedagogical practices and class room management techniques used by the teachers.
837.7-853.7 To reflect upon the roles and responsibilities of different school staff and Critical study of the infrastructural facilities.
837.8-853.8 To bring about personality development with regard to the different behavioral dimensions that has far reaching significance for teachers.

‘Student-Teachers’ Tasks:

A) Engagement with the Field (EWF)

This includes sustain engagement with Self, Child, Community and School at different levels through establishing close connection between curricular areas. This would include task and assignments running through all curricular areas i.e. Perspectives in education, Curriculum & Pedagogical studies and EPC. Evaluation of these tasks and Assignments will be considered with respective Course I to XII (part of Internal Assessment).

B) School Internship Programme (SIP)

During SIP a ‘student-teacher’ shall observe & undertake various activities aimed at understanding the ‘Internship School’ and the ‘Community’ around.

B.Ed. – Ist Year

Observation of school functioning in terms of :

- i) Teaching- Learning process and related tasks & Classroom teaching undertaken by school-teacher.
- ii) Developing teacher sensibilities and skills under the mentorship of school Head/ school teacher/ faculty.
- iii) Understanding need & process of CCE (Comprehensive & Continuous Evaluation), Maintenance of various records, Development of learning material.
- iv) Documentation of the above activities in the form of a brief comprehensive report.

B.Ed. – IInd Year

1. Observe and record 10 lessons of regular classroom teaching of **teachers** for each pedagogic subject This write up will be preceded by general information of PT and with particular focus on

- i. *Teaching method*
- ii. *Use of teaching aids*
- iii. *Pupil teacher interaction in the class*
- iv. *Class room management*
- v. *Homework (checking and feedback)*

2. Critically analyse syllabus and textbook of respective pedagogic subject for one class.

This write up will be preceded by general information of PT with particular focus on

- i. *Physical Aspect*
- ii. *Nature of Content*
- iii. *Organisation of Content*
- iv. *Presentation of Content*
- v. *Style*
- vi. *Illustration*
- vii. *Exercise & Project*
- viii. *Bibliography*

3. Observe and record 10 lessons of regular classroom teaching of Peers for each pedagogic subject. This write up will be preceded by general information of PT with particular focus on:

- i. *Teaching method*
- ii. *Use of teaching aids*
- iii. *Pupil teacher interaction in the class*
- iv. *Class room management*
- v. *Homework (checking and feedback)*

4. Prepare a brief report of the internship school.

- i. *General Information of PT*
- ii. *Physical infrastructure*
- iii. *Pupil Teacher Ratio (PTR)*
- iv. *Curriculum Transactions*
- v. *Pupil Teacher Interaction(curricular as well as co-curricular)*

5. Plan and write five lesson each of both the pedagogic subjects as follows:

- i. *General information*
- ii. *Instructional Aids*
- iii. *Writing Objectives in Behavioral terms*
- iv. *Assumed Previous Knowledge*
- v. *Previous Knowledge Testing Questions*
- vi. *Announcement of the topic*
- vii. *Presentation*
- viii. *Recapitulation*

ix. Home-Assignment

6. Teach 2-4 period per day in respective pedagogic subject
7. Teach classes as and when directed by the mentor teacher /head of the lab school.
8. Prepare and use teaching aids like model/chart/ flash card etc for making the teaching effective and interesting. At least 2 teaching aids in each subject shall be evaluated for the purpose of internal assessment.
9. Prepare a question paper of full syllabus of any one chart for any one subject along with its blue print:
10. Preparation of a diagnostic tests and organisation of remedial teaching
11. Undertake action research project on at least one problem area of schooling.
12. Identify, plan and execute any one activity closely related to the local environment.
13. Maintain a reflective diary to record day to day happenings and reflections thereon.

While selecting the units of the syllabus, the student-teachers shall follow the annual instructional plan drawn by the host school.

INSTITUTE OF TEACHER TRAINING & RESEARCH

KURUKSHETRA UNIVERSITY, KURUKSHETRA

B.Ed. Two Year (Gen) Syllabus- CBCS

Mapping Scale, Mapping Matrices, Attainment of COs, POs and PSOs

A: Mapping scale:-

Table 1: Scale of mapping between COs and POs/PSOs

Scale	
1	Low correlation between the contents of course and the particular Program outcome/Program specific outcome
2	Medium corelation between the contents of course and the particular Program outcome/Program specific outcome
3	High corelation between the contents of course and the particular Program outcome/Program specific outcome

B: Mapping matrices:

CO-PO Mapping matrices

Table 2. CO-PO Matrix for the Course-I Code :801

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
801.1	3	1	0	0	0	0	0	0	0
801.2	3	1	1	0	0	0	0	0	0
801.3	3	2	2	2	2	2	2	3	1
801.4	3	3	2	2	1	2	2	2	0
801.5	3	1	3	2	2	2	2	1	2
801.6	3	2	3	2	2	2	2	1	2
801.7	3	2	2	2	0	2	2	2	2
801.8	3	1	2	2	0	1	1	2	2
Average	3	1.63	1.88	1.5	0.88	1.38	1.38	1.38	1.13

Table 2. CO-PO Matrix for the Course-II Code :802

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
802.1	3	3	2	2	1	3	3	2	2
802.2	3	2	1	1	3	2	3	3	2
802.3	3	3	2	1	1	2	2	2	1
802.4	3	3	2	2	3	2	3	3	2
802.5	3	3	2	1	1	2	2	2	1
802.6	3	2	3	2	3	3	3	2	2
802.7	3	3	2	2	3	2	3	3	3
802.8	2	2	2	3	3	3	2	2	1
Average	2.88	2.63	2	1.75	2.25	2.38	2.63	2.38	1.75

Table 2. CO-PO Matrix for the Course-III Code :803

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
803.1	3	3	3	3	3	3	3	2	2
803.2	3	1	3	3	3	3	3	2	3
803.3	3	3	3	3	3	3	3	1	1
803.4	3	3	3	3	3	3	3	1	1
803.5	3	3	3	3	3	3	2	1	3
803.6	3	3	3	3	3	3	2	2	1
803.7	3	2	3	3	3	3	2	1	2
803.8	3	1	3	3	3	3	3	1	1
Average	3	2.38	3	3	3	3	2.63	1.38	1.75

Table 2. CO-PO Matrix for the Course-IV-A Code :804

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
804.1	3	3	3	2	3	3	2	2	3
804.2	2	3	3	2	3	3	2	1	3
804.3	3	2	3	1	3	3	2	2	3
804.4	3	2	3	3	3	2	2	2	3
Average	2.75	2.5	3	2	3	2.75	2	1.75	3

Table 2. CO-PO Matrix for the Course-IV-B Code :805

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
805.1	2	3	1	1	1	3	2	1	1
805.2	1	3	2	1	2	2	2	2	1

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805.3	2	1	2	2	1	1	1	2	1
805.4	1	2	1	3	2	1	1	3	1
Average	1.5	2.25	1.5	1.75	1.5	1.75	1.5	2	1

Table 2. CO-PO Matrix for the Course-V Code :806

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
806.1	3	2	1	1	3	2	2	2	1
806.2	3	3	2	2	3	3	2	2	1
806.3	3	2	1	1	3	2	2	2	1
806.4	3	3	2	2	3	3	2	2	2
Average	3	2.5	1.5	1.5	3	2.5	2	2	1.25

Table 2. CO-PO Matrix for the Course-VI & VII Code :807-823

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
807.1-823.1	3	2	2	2	3	2	2	2	1
807.2-823.2	3	2	3	3	3	2	3	1	3
807.3-823.3	3	2	3	3	3	1	1	1	2
807.4-823.4	3	2	3	3	3	1	3	1	3
807.5-823.5	3	2	2	2	3	2	2	2	3
807.6-823.6	3	3	3	3	3	1	2	1	3
807.7-823.7	3	2	3	2	3	1	1	1	2
807.8-823.8	3	2	3	3	3	2	3	1	2
Average	3	2.13	2.75	2.62	3	1.5	2.13	1.25	2.38

Table 2. CO-PO Matrix for the Course-VIII Code :824

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
824.1	3	3	1	3	2	2	3	2	1
824.2	3	3	1	1	3	2	2	2	1
824.3	3	3	2	2	3	2	3	2	2
824.4	3	2	2	2	3	2	3	3	2
824.5	3	2	3	3	3	2	2	2	1
824.6	3	3	2	2	3	2	2	3	3
824.7	3	2	3	3	3	2	2	2	1
824.8	2	2	3	3	2	2	3	1	3
Average	2.88	2.5	2.13	2.38	2.75	2	2.5	2.13	1.75

Table 2. CO-PO Matrix for the Course-IX Code :825

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
825.1	3	3	2	2	1	2	1	0	0
825.2	3	3	2	2	2	2	1	1	1
825.3	3	3	2	2	1	0	2	0	0
825.4	3	3	2	2	1	3	0	1	1
825.5	3	3	2	2	1	1	1	1	1
825.6	3	3	2	2	2	2	2	2	2
825.7	3	3	2	2	1	2	0	1	1
825.8	3	3	2	2	2	2	2	2	2
Average	3	3	2	2	1.38	2	1.5	1.33	1.33

Table 2. CO-PO Matrix for the Course-X Code :826

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
826.1	2	1	1	2	2	2	2	2	2
826.2	2	2	1	1	2	1	1	2	1
826.3	1	2	2	2	3	3	3	2	2
826.4	1	2	2	3	3	3	3	1	1
Average	1.5	1.75	1.5	2	2.5	2.25	2.25	1.75	1.5

Table 2. CO-PO Matrix for the Course-XI (i) Code :827

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
827.1	3	2	2	2	3	1	1	2	1
827.2	3	3	2	2	3	1	3	2	1
827.3	3	2	3	2	3	2	2	2	3
827.4	3	2	3	2	3	2	3	2	2
Average	3	2.25	2.5	2	3	1.50	2.25	2	1.75

Table 2. CO-PO Matrix for the Course-XI (ii) Code :828

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
828.1	3	3	1	2	3	1	2	2	1
828.2	3	3	2	1	3	1	3	3	1
828.3	3	3	3	2	3	2	2	2	1

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828.4	3	3	3	2	3	1	3	2	3
Average	3	3	2.25	1.75	3	1.25	2.50	2.25	1.50

Table 2. CO-PO Matrix for the Course-XI (iii) Code :829

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
829.1	3	2	3	1	3	3	2	2	2
829.2	3	2	3	1	3	2	3	1	1
829.3	3	3	3	2	3	2	2	1	1
829.4	3	3	2	1	3	1	2	1	1
Average	3	2.50	2.75	1.25	3	2	2.25	1.25	1.25

Table 2. CO-PO Matrix for the Course-XI (iv) Code :830

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
830.1	3	3	3	3	3	3	3	3	1
830.2	3	3	3	3	3	3	2	3	1
830.3	3	3	3	3	3	3	3	1	2
830.4	3	3	3	3	3	3	3	1	2
Average	3	3	3	3	3	3	2.75	2	1.50

Table 2. CO-PO Matrix for the Course 12(i)- Code :831

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
831.1	3	3	3	3	3	2	2	1	3
831.2	3	3	3	3	2	2	2	3	3
831.3	3	3	3	3	2	2	3	3	3
831.4	3	3	3	3	3	3	3	2	3
Average	3	3	3	3	2.5	2.25	2.5	2.25	3

Table 2. CO-PO Matrix for the Course 12(ii)- Code :832

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
832.1	2	2	3	1	1	3	1	3	2
832.2	1	2	2	1	1	2	1	2	3
832.3	2	1	3	2	2	1	1	2	2
832.4	1	2	2	3	2	1	1	3	2
Average	1.5	1.75	2.50	1.75	1.5	1.75	1	2.5	2.25

Table 2. CO-PO Matrix for the Course 12(iii)- Code :833

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
833.1	3	2	3	1	3	1	1	1	3
833.2	3	3	3	2	3	1	1	1	3
833.3	3	2	2	1	1	1	1	1	2
833.4	3	2	2	2	2	2	2	2	2
Average	3	2.25	2.50	1.50	2.25	1.25	1.25	1.25	2.5

Table 2. CO-PO Matrix for the Course 12(iv)- Code :834

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
834.1	0	0	2	2	0	0	0	0	2
834.2	0	0	1	1	0	1	2	3	0
834.3	2	3	3	3	2	3	3	2	2
834.4	0	0	3	3	1	0	2	3	1
Average	0.5	0.75	2.25	2.25	0.75	1	1.75	2	1.25

Table 2. CO-PO Matrix for the Course 13 Code :837-853

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
837.1- 853.1	3	2	3	3	3	2	2	1	1
837.2- 853.2	3	2	2	1	2	3	3	2	3
837.3- 853.3	3	3	3	2	3	2	3	2	3
837.4-853.4	3	3	2	2	3	2	3	1	2
837.5-853.5	3	2	3	2	3	2	3	2	3
837.6-853.6	3	3	3	3	3	3	3	3	3
837.7-853.7	3	3	3	3	2	3	2	3	2
837.8-853.8	3	2	2	3	2	3	2	3	3
Average	3.00	2.50	2.63	2.38	2.63	2.50	2.63	2.13	2.50

CO-PSO MATRIX

Table 3. CO-PSO Matrix for the Course-1) Code :801

COs	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
801.1	1	0	0	0	0	0	0	0	1	0
801.2	2	0	1	0	0	0	1	0	1	2
801.3	2	0	2	2	1	0	1	2	1	2
801.4	2	0	1	1	1	0	1	2	0	1
801.5	2	0	1	1	2	0	1	1	0	2
801.6	2	0	1	2	2	0	0	1	0	1
801.7	2	1	3	0	2	0	3	2	2	2
801.8	2	2	2	1	2	0	3	1	3	1
Average	1.87	0.37	1.37	0.87	1.25	0	1.25	1.12	1	1.37

Table 3. CO-PSO Matrix for the Course-2) Code :802

Cos	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
802.1	2	3	2	1	1	1	2	1	2	1
802.2	2	3	3	2	1	1	3	1	3	2
802.3	1	2	1	1	2	1	2	1	1	1
802.4	2	2	3	1	2	1	2	1	2	1
802.5	1	2	1	1	2	1	2	1	1	1
802.6	3	3	3	3	3	2	3	2	2	3
802.7	2	2	2	1	2	1	3	1	2	2
802.8	3	3	2	2	2	1	2	1	2	2
Average	2	2.5	2.12	1.5	1.87	1.12	2.37	1.12	1.87	1.62

Table 3. CO-PSO Matrix for the Course-3 Code :803

Cos	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
803.1	3	0	3	3	1	0	2	2	1	1
803.2	3	1	3	3	1	0	3	3	1	1
803.3	3	0	3	3	1	0	3	2	1	0
803.4	3	0	3	3	1	0	3	3	1	0
803.5	3	2	3	3	1	0	3	3	1	1
803.6	3	0	3	3	1	0	2	2	1	1
803.7	3	0	3	3	1	0	1	2	1	1
803.8	3	1	2	2	2	0	2	2	1	1
Average	3	0.5	2.87	2.87	1.12	0	2.37	2.37	1	0.75

Table 3. CO-PSO Matrix for the Course-4(A) Code :804

Cos	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
804.1	1	1	2	2	3	1	3	3	2	2
804.2	2	2	3	3	3	1	3	3	2	2
804.3	2	2	3	2	3	1	2	3	2	2
804.4	2	2	3	3	3	1	2	3	2	3
Average	1.75	1.75	2.75	2.5	3	1	2.5	3	2	2.25

Table 3. CO-PSO Matrix for the Course-4(B) Code :805

Cos	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
805.1	1	2	1	2	3	1	2	1	1	2
805.2	1	3	2	2	3	2	3	1	2	1
805.3	1	3	2	1	3	1	3	1	2	2
805.4	2	2	2	2	2	1	3	2	2	1
Average	1.25	2.5	1.75	1.75	2.75	1.25	2.75	1.25	1.75	1.5

Table 3. CO-PSO Matrix for the Course-5 Code :806

Cos	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
806.1	1	1	3	2	3	1	3	1	3	2
806.2	2	1	3	3	3	1	3	1	3	2
806.3	2	3	3	2	3	1	3	1	3	2
806.4	2	1	3	2	3	1	3	1	3	2
Average	1.75	1.5	3	2.25	3	1	3	1	3	2

Table 3. CO-PSO Matrix for the Course-6&7 Code :807 to 823

Cos	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
807.1-823.1	1	1	2	2	3	1	2	1	1	2
807.2-823.2	1	1	2	2	2	1	2	1	1	2
807.3-823.3	1	1	3	2	2	1	2	1	1	2
807.4-823.4	1	1	3	3	2	2	2	1	1	3
807.5-823.5	1	1	1	2	2	1	2	1	1	2
807.6-823.6	1	1	1	2	2	1	2	1	1	2
807.7-823.7	1	1	2	2	2	1	2	1	1	2
807.8-823.8	1	1	1	2	2	1	2	1	1	2
Average	1	1	1.87	2.12	2.12	1.12	2	1	1	2.12

Table 3. CO-PSO Matrix for the Course-8 Code :824

Cos	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
824.1	2	1	1	1	3	1	2	1	1	2
824.2	2	1	2	2	3	1	2	1	1	2
824.3	2	1	3	1	2	1	3	1	2	2
824.4	2	1	3	2	3	1	3	1	2	2
824.5	2	2	2	3	3	2	3	1	2	2
824.6	3	2	2	2	3	1	2	1	2	2
824.7	1	1	2	2	2	1	2	1	2	2
824.8	2	2	2	3	3	2	2	1	2	2
Average	2	1.37	2.12	2	2.75	1.25	2.37	1	1.75	2

Table 3. CO-PSO Matrix for the Course-9 Code :825

COs	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
825.1	0	1	0	1	2	0	2	0	0	2
825.2	2	2	2	2	2	2	2	0	0	3
825.3	2	0	1	1	2	0	0	0	0	3
825.4	2	0	0	2	1	0	0	0	0	3
825.5	1	2	1	2	1	0	0	0	0	3
825.6	2	2	2	2	2	0	2	0	0	3
825.7	2	0	0	1	2	0	0	0	0	2
825.8	2	1	1	1	2	1	1	0	0	3
Average	1.62	1	0.87	1.5	1.75	0.37	0.87	0	0	2.75

Table 3. CO-PSO Matrix for the Course-10 Code :826

Cos	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
826.1	3	1	3	1	1	2	2	2	2	3
826.2	2	3	2	2	2	1	2	2	2	2
826.3	3	2	3	2	2	2	2	1	1	2
826.4	1	2	1	2	1	2	2	2	1	3
Average	2.25	2	2.25	1.75	1.5	1.75	2	1.75	1.5	2.5

Table 3. CO-PSO Matrix for the Course-11(i) EE Code :827

Cos	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
827.1	1	1	1	1	1	1	2	3	1	2
827.2	1	2	2	2	2	1	2	3	1	1
827.3	1	1	1	2	2	1	2	3	1	1
827.4	1	1	1	2	2	1	2	3	1	2
Average	1	1.25	1.25	1.75	1.75	1	2	3	1	1.5

Table 3. CO-PSO Matrix for the Course-11(ii) Code : 828

Cos	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
828.1	2	1	2	2	3	1	2	2	2	2
828.2	2	1	3	3	3	1	3	3	2	2
828.3	3	1	2	2	3	1	3	2	2	2
828.4	2	1	2	2	1	2	1	3	3	2
Average	2.25	1	2.25	2.25	2.5	1.25	2.25	2.5	2.25	2

Table 3. CO-PSO Matrix for the Course-11(iii) Code : 829

Cos	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
829.1	2	1	2	2	2	1	3	1	1	2
829.2	1	1	1	2	2	1	3	1	1	1
829.3	1	1	1	2	2	1	3	1	1	1
829.4	1	2	1	2	2	1	3	1	1	1
Average	1.25	1.25	1.25	2	2	1	3	1	1	1.25

Table 3. CO-PSO Matrix for the Course-11(iv) Code :830

COs	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
830.1	3	3	3	3	1	0	3	2	3	1
830.1	3	2	3	2	1	0	3	1	2	1
830.1	3	2	3	3	1	0	3	1	1	1
830.1	3	2	3	2	1	0	3	1	2	1
Average	3	2.25	3	2.5	1	0	3	1.25	2	1

Table 3. CO-PSO Matrix for the Course-12 (i) Code : 831

COs	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
831.1	1	1	1	3	3	1	2	1	1	2
831.2	1	1	1	3	2	1	2	1	1	2
831.3	1	1	1	3	2	1	1	1	1	2
831.4	1	1	2	3	3	1	2	1	1	3
Average	1	1	1.25	3	2.5	1	1.75	1	1	2.25

Table 3. CO-PSO Matrix for the Course-12 (ii) Code : 832

COs	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
832.1	1	1	1	3	2	1	2	3	1	2
832.2	1	1	2	3	3	1	1	2	2	3
832.3	1	1	2	2	2	1	2	3	2	2
832.4	2	1	2	3	2	1	1	2	2	3
Average	1.25	1	1.75	2.75	2.25	1	1.5	2.5	1.75	2.5

Table 3. CO-PSO Matrix for the Course-12 (iii) Code : 833

COs	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
833.1	1	1	1	2	2	3	2	1	1	1
833.2	1	1	1	2	2	3	2	1	1	2
833.3	1	1	1	1	2	3	2	1	1	2
833.4	1	1	1	1	2	3	2	1	1	2
Average	1	1	1	1.5	2	3	2	1	1	1.75

Table 3. CO-PSO Matrix for the Course-12 (iv) Code : 834

COs	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
834.1	3	0	0	3	0	0	0	0	1	0
834.2	3	2	2	0	0	0	2	0	3	0
834.3	3	1	0	2	3	2	2	2	2	3
834.4	3	0	0	3	0	0	0	0	0	3
Average	3	0.75	0.5	2	0.75	0.5	1	0.5	1.5	1.5

Table 3. CO-PSO Matrix for the Course-13 Code : 837 to 853

COs	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
837.1- 853.1	2	1	2	3	3	2	2	3	3	2
837.2- 853.2	2	1	2	1	3	2	3	2	2	2
837.3- 853.3	1	0	3	2	3	0	3	3	3	2
837.4-853.4	2	0	2	1	2	3	3	3	3	3
837.5-853.5	2	1	3	3	3	2	3	3	3	2
837.6-853.6	3	2	2	2	2	3	3	2	2	2
837.7-853.7	0	0	2	2	3	2	3	2	2	2
837.8-853.8	1	0	2	2	3	0	2	3	3	3
Average	1.63	0.63	2.25	2.00	2.75	1.75	2.75	2.63	2.63	2.25

Table 4: CO-PO – PSO MAPPING MATRIX for B.Ed. II Year (Gen)

Course Code	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6	PSO-7	PSO-8	PSO-9	PSO-10
CO-801	3	1.63	1.88	1.5	0.88	1.38	1.38	1.38	1.13	1.87	0.37	1.37	0.87	1.25	0	1.25	1.12	1	1.37
CO-802	2.88	2.63	2	1.75	2.25	2.38	2.63	2.38	1.75	2	2.5	2.12	1.5	1.87	1.12	2.37	1.12	1.87	1.62
CO-803	3	2.38	3	3	3	3	2.63	1.38	1.75	3	0.5	2.87	2.87	1.12	0	2.37	2.37	1	0.75
CO-804	2.75	2.5	3	2	3	2.75	2	1.75	3	1.75	1.75	2.75	2.5	3	1	2.5	3	2	2.25
CO-805	1.5	2.25	1.5	1.75	1.5	1.75	1.5	2	1	1.25	2.5	1.75	1.75	2.75	1.25	2.75	1.25	1.75	1.5
CO-806	3	2.5	1.5	1.5	3	2.5	2	2	1.25	1.75	1.5	3	2.25	3	1	3	1	3	2
CO-(807-823)	3	2.13	2.75	2.62	3	1.5	2.13	1.25	2.38	1	1	1.87	2.12	2.12	1.12	2	1	1	2.12
CO-824	2.88	2.5	2.13	2.38	2.75	2	2.5	2.13	1.75	2	1.37	2.12	2	2.75	1.25	2.37	1	1.75	2
CO-825	3	3	2	2	1.38	2	1.5	1.33	1.33	1.62	1	0.87	1.5	1.75	0.37	0.87	0	0	2.75
CO-826	1.5	1.75	1.5	2	2.5	2.25	2.25	1.75	1.5	2.25	2	2.25	1.75	1.5	1.75	2	1.75	1.5	2.5
CO-827	3	2.25	2.5	2	3	1.50	2.25	2	1.75	1	1.25	1.25	1.75	1.75	1	2	3	1	1.5
CO-828	3	3	2.25	1.75	3	1.25	2.50	2.25	1.50	2.25	1	2.25	2.25	2.5	1.25	2.25	2.5	2.25	2

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CO-829	3	3	3	3	3	3	2.75	2	1.50	1.25	1.25	1.25	2	2	1	3	1	1	1.25
CO-830	3	3	3	3	3	3	2.75	2	1.50	3	2.25	3	2.5	1	0	3	1.25	2	1
CO-831	3	3	3	3	2.5	2.25	2.5	2.25	3	1	1	1.25	3	2.5	1	1.75	1	1	2.25
CO-832	1.5	1.75	2.50	1.75	1.5	1.75	1	2.5	2.25	1.25	1	1.75	2.75	2.25	1	1.5	2.5	1.75	2.5
CO-833	3	2.25	2.50	1.50	2.25	1.25	1.25	1.25	2.5	1	1	1	1.5	2	3	2	1	1	1.75
CO-834	0.5	0.75	2.25	2.25	0.75	1	1.75	2	1.25	3	0.75	0.5	2	0.75	0.5	1	0.5	1.5	1.5
CO-837-853	3.00	2.50	2.63	2.38	2.63	2.50	2.63	2.13	2.50	1.63	0.63	2.25	2.00	2.75	1.75	2.75	2.63	2.63	2.25

C. Attainment of COs:

Table 5: CO Attainment levels for Internal Assessment

Attainment Level	
1 (Low level of attainment)	60 % of students score more than 60% of marks in internal assessment and end semester examination
2 (Medium level of attainment)	70 % of students score more than 60% of marks in internal assessment and end semester examination
3 (High level of attainment)	80 % of students score more than 60% of marks in internal assessment and end semester examination

Table 6: CO Attainment levels for End Session Examination (ESE)

Attainment Level	
1 (Low level of attainment)	60 % of students score more than 60% of marks in internal assessment and end semester examination
2 (Medium level of attainment)	70 % of students score more than 60% of marks in internal assessment and end semester examination
3 (High level of attainment)	80 % of students score more than 60% of marks in internal assessment and end semester examination

Overall CO Attainment level:

Overall COs attainment level=50% of CO attainment level in Internal Assessment+50% of CO attainment level in End Session Examination

D. Attainment of POs:

The overall attainment level of POs is based on the values obtained by using direct and indirect methods in the ratio 80:20. PO attainment values obtained using direct method are computed as detailed in Table 7 below.

Table 7: PO Attainment Values using Direct Method

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-801									
CO-802									
CO-803									
CO-804									
CO-805									
CO-806									
CO-(807-823)									
CO-824									
CO-825									
CO-826									
CO-827									
CO-828									
CO-829									
CO-830									
CO-831									
CO-832									
CO-833									
CO-834									
Direct PO Attainment	Average of above values	Average of above values	Average of above values	Average of above values	Average of above values	Average of above values			

The PO attainment values to be filled in the above table can be obtained as follows:

For Course 801-PO1 Cell: PO1 attainment value = (Mapping factor of 801-PO1 from Table 4 x Overall CO attainment value for the course 801/3.

Same method can be used to obtain attainment values for the other POs.

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In order to obtain the PO attainment using the indirect method, a student exit survey based on questionnaire of POs may be conducted at the end of last semester of the program, as per the following format:

Table 8: Questionnaire for indirect measurement of PO attainment
(For outgoing students)

At the end of my degree program I am able to do:

	Please tick any one		
<i>Acquire knowledge & skills about human development, contemporary Indian education, and pedagogy of various school subjects and assessment for learning.</i>	3	2	1
<i>Develop an understanding of education as an agenda for the nation and its policies, visions and efforts in evolving a national system of education.</i>	3	2	1
<i>Re-engage with the nuances of the discipline and its prevalent conceptualizations and practices.</i>	3	2	1
<i>Develop understanding about teaching, pedagogy, school management and community involvement in general education and Inclusive settings.</i>	3	2	1
<i>Inculcate a sense of responsibility towards the society and respect for human life and dignity.</i>	3	2	1
<i>Promote co-operative teaching where two or more teachers offer a course and jointly interact with the same class particularly to facilitate multi-disciplinary analysis of problems.</i>	3	2	1
Indirect PO attainment	Average of the responses from the outgoing students for each PO		
Scale: 3: Strongly Agree; 2: Agree; 1: Average			

The overall PO attainment values are obtained by adding attainment values estimated using direct and indirect methods in the proportion of 80:20 as follows:

Overall attainment value for PO1 = $0.8 \times \text{average attainment value for PO1 using direct method (from table 7)} + 0.2 \times \text{average response of outgoing students for PO1}$.

Table 9: Overall PO attainment values

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
Direct PO attainment									
Indirect PO attainment									
Overall PO attainment									
Target	2	2	2	2	1.5	2	2	2	2

The overall PSO attainment level based on CO-PSO mapping values and overall CO attainment values can be obtained in a similar manner.

SCHEME OF EXAMINATION

&

SYLLABI

OF

MASTER OF SOCIAL WORK (MSW)

For

**First, Second, Third and Fourth Semesters
(W.e.f. 2020-21 Academic Session)**

Choice Based Credit System (CBCS)

&

**Learning Outcome Based Curriculum Framework
(L.O.C.F.)**

SCHEME OF EXAMINATION AND SYLLABUS FOR MASTER OF SOCIAL WORK
Under CBCS/LOCF implement w.e.f. 2020-21 in phased manner for the regular
students of the University Teaching Departments (UTD)

The MSW (Master of Social Work) Examination has been divided into four semesters spread over two years. Every student has to pass 132 Credit [112 Compulsory + 16 Optional Credit and 4 Credit (2 in semester –II and 2 in semester –III) from Optional Elective Paper from Other Departments] out of 196 credit is necessary to earn the degree under the new scheme i.e. **Choice Based Credit System**.

However, the choice of Optional credit is subjected to the availability of teaching faculty in the Department. The paper scheme detail semester – wise is as follow:-

Sr. No.	Name of the Subject /Paper	No. of credit	Teaching Scheme (Hrs/Week)			Examination Scheme (Marks)			Duration of Exam (in Hrs)
			L	T	P	(Sem. Theory exam)	Internal Assessment	Total	
Master of Social Work (MSW) Semester-I									
MSW(C) -101	Society and Current Social Problems	4	4	----	-----	80	20	100	3
MSW(C) -102	Human Growth and Development-I	4	4	----	-----	80	20	100	3
MSW(C)- 103	Social Work Profession: Philosophy and Concepts	4	4	----	-----	80	20	100	3
MSW(C)- 104	Social Case Work-I	4	4	----	-----	80	20	100	3
MSW(C)- 105	Social Group Work-I	4	4	----	-----	80	20	100	3
MSW(C)- 106	Community Organization and Social Action-I	4	4	----	-----	80	20	100	3
MSW(C)- 107	*Field Work Practicum	8	-----	----	8x2=16	150	50	200	--
Total (A)		32						800	

*** Field Work (Detail of marks)**

I External Viva-Voce: 150 marks

II Internal Assessment: 50 marks :

- a. Field Work Assessment : 25 marks
- b. Organizational Visit : 25 marks

Master of Social Work (MSW) Semester-II									
MSW(C) -201	Social Justice and Social Legislation in the New Millennium (21 st Century)	4	4	----	-----	80	20	100	3
MSW(C) -202	Human Growth and Development-II	4	4	----	-----	80	20	100	3
MSW(C) -203	Health Care, Needs and Services	4	4	----	-----	80	20	100	3
MSW(C) -204	Social Case Work-II	4	4	----	-----	80	20	100	3
MSW(C) -205	Social Group Work-II	4	4	----	-----	80	20	100	3
MSW(C) -206	Community Organization and Social Action-II	4	4	----	-----	80	20	100	3
MSW(C) -207	*Field Work Practicum	8	-----	----	8x2= 16	150	50	200	--
	**Open Elective Paper	2	1	----	-----	50	----	50	2
Total (B)		34						850	

*** Field Work (Detail of marks)**

I External Viva-Voce: 150 marks

II Internal Assessment: 50 marks :

- a. Field Work Internal Assessment : 25 marks
- b. Summer Placement : 25 marks

**** Open Elective Paper** (to be opted out of various subjects offered by faculty of Social Sciences.)

Master of Social Work (MSW) Semester-III									
MSW(C) -301	Social Policy and Planning: Current Issues and Strategies	4	4	-----	-----	80	20	100	3
MSW(C) -302	Administration of Welfare Services	4	4	-----	-----	80	20	100	3
MSW(C) -303	Social Work Research and Statistics-I	4	4	-----	-----	80	20	100	3
MSW(C) -304	Mental Health Care, Services and Counseling	4	4	-----	-----	80	20	100	3
Candidate has to choose any one Specialization out of Group I to V during 3rd and the same has to be continued in 4th semester.									
Group-I Human Resource Management, Industrial Relations and Labour Welfare									
MSW(E) -305	Human Resource Management and Industrial Relations-I	4	4	-----	-----	80	20	100	3
MSW(E) -306	Labour Welfare and Labour Legislations-I	4	4	-----	-----	80	20	100	3
Group-II Family and Child Welfare									
MSW(E) -307	Family Dynamics: Issues & Needs-I	4	4	-----	-----	80	20	100	3
MSW(E) -308	Developmental Services for Women and Children-I	4	4	-----	-----	80	20	100	3
Group-III Medical And Psychiatric Social Work									
MSW(E) -309	Policy and Development of Health Care-I	4	4	-----	-----	80	20	100	3
MSW(E) -310	Psycho-social Perspectives on Mental Health-I	4	4	-----	-----	80	20	100	3
Group-IV Community Development									
MSW(E) -311	Rural Community Development: Policies and Programmes-I	4	4	-----	-----	80	20	100	3
MSW(E) -312	Urban Community Development: Policies and Programmes-I	4	4	-----	-----	80	20	100	3
Group-V Criminology and Correctional Administration									
MSW(E) -313	Crime and Criminal Justice-I	4	4	-----	-----	80	20	100	3
MSW(E) -314	Institutional Services & Rehabilitation of Criminals-I	4	4	-----	-----	80	20	100	3

MSW(C)- 315	*Field Work Practicum	8	-----	-----	8x2=16	150	50	200	--
	**Open Elective Paper	2	1	-----	-----	50	----	50	2
Total (C)		34						850	

*** Field Work (Detail of marks)**

I External Viva-Voce: 150 marks

II Internal Assessment: 50 marks :

a. Field Work Internal Assessment : 25 marks

b. Field Work Presentation : 25 marks

**** Open Elective Paper** (to be opted out of various subjects offered by faculty of Social Sciences.)

Master of Social Work (MSW) Semester-IV									
MSW(C) -401	Dynamics of Social Development in View of Globalization	4	4	-----	-----	80	20	100	3
MSW(C) -402	Population, Environment & Disaster Management	4	4	-----	-----	80	20	100	3
MSW(C) -403	Social Work Research and Statistics-II	4	4	-----	-----	80	20	100	3
MSW(C) -404	Emerging Areas of Social Work Practice	4	4	-----	-----	80	20	100	3
Group-I Human Resource Management, Industrial Relations and Labour Welfare									
MSW(E) -405	Human Resource Management and Industrial Relations-II	4	4	-----	-----	80	20	100	3
MSW(E) -406	Labour Welfare and Labour Legislations-II	4	4	-----	-----	80	20	100	3
Group-II Family and Child Welfare									
MSW(E) -407	Family Dynamics: Issues & Needs-II	4	4	-----	-----	80	20	100	3
MSW(E) -408	Developmental Services for Women and Children-II	4	4	-----	-----	80	20	100	3
Group-III Medical And Psychiatric Social Work3									
MSW(E) -409	Policy and Development of Health Care-II	4	4	-----	-----	80	20	100	3
MSW(E) -410	Psycho-social Perspectives on Mental Health-II	4	4	-----	-----	80	20	100	3
Group-IV Community Development									
MSW(E) -411	Rural Community Development: Policies and Programmes-II	4	4	-----	-----	80	20	100	3
MSW(E) -412	Urban Community Development: Policies and Programmes-II	4	4	-----	-----	80	20	100	3
Group-V Criminology and Correctional Administration									
MSW(E) -413	Crime and Criminal Justice-II	4	4	-----	-----	80	20	100	3
MSW(E) -414	Institutional Services & Rehabilitation of Criminals-II	4	4	-----	-----	80	20	100	3
MSW(C)- 415	*Field Work Practicum	8	-----	-----	8x2=16	150	50	200	--

Total (D)	32						800	
GRAND TOTAL (A+B+C+D)	132						3300	

*** Field Work (Detail of marks)**

I External Viva-Voce: 150 marks

II Internal Assessment: 50 marks :

a. Field Work Internal Assessment : 25 marks

b. Block Placement : 25 marks

FIELD WORK PRACTICUM

Field Work Practicum is closely supervised educational internship in a Social work setting that provides planned opportunities to apply theory taught in classrooms to Field Situations, which in-turn, enhance classroom learning.

‘Knowing’ does not automatically result in the ability of 'doing' so necessary for professional development therefore, a distinctive feature of the instructional programmes at the department is the emphasis laid on field work as an integral part of the total curriculum. Field Work enables the student to integrate and reinforce the knowledge acquired in the classroom with actual practice under competent supervision provided by field work supervisors in the department as well as in the field work agency. The content of field work is planned to provide an orderly sequence of learning.

General Objectives of Field Work Practicum

The Field Work Programme has been designed to achieve the following objectives.

- 1 To develop among students, the ability to integrate theoretical learning with practice experience.
- 2 To enable students to develop core skills of Social Work practice.
- 3 To facilitate the development of thinking feelings and attitudes relevant to professional practice.
- 4 To help students understand the socio-economic, cultural and political milieu and develop capacity for critical examination of positive and maintenance factors of social problems and their consequences.
- 5 To provide students with an opportunity to apply theories in practical situations for problem solving with individuals, groups and community.
- 6 To help students identify, plan and implement social work instruments and to assess their impact on different client system in various agency settings.
- 7 To help students appreciate the role of social work profession in empowering individuals, groups and communities and in facilitating social change.
- 8 To help students to develop skills and appropriate personality required for professional social work practice.
- 9 To provide opportunities to accept challenges and respond to them.

- 10 Development of critical self-awareness about one's attributes values and sensitivities with reference to ideologies of social justice and critical requirements of social work profession through experience.

Field work Objectives for 1st and 2nd Semesters

The emphasis is on learning skills which revolve around specific tasks where cause-effect relationships are understood, where the persons have problems but they are more victims of their life circumstances rather than of pathology for which great knowledge of psychological and social dynamics would be required and lower order of skills of intervention is required to be utilized.

The processes dealt with at the individual, group or community are specific. Show dynamics but do not require unusual skills of intervention.

Administrative tasks are also specific, e.g. planning and programming around a specific service. The specific objectives of field-work in the 1st year of the course (I & II Semesters) may include:

1. Development of the knowledge of:
 - (a) Socio-economic background and the living condition of the vulnerable groups and the problems confronting them.
 - (b) Problem-solving techniques utilized in the specific area of work of the organization where student is placed.
 - (e) The use of simple research procedures and maintenance of scientific data to assess problems/needs/agency.
2. Development of skills in :
 - (a) Work with individuals, families, groups and communities and seeing the need for an integrated approach to problem solving.
 - (b) Selecting and utilization of community resources.
 - (c) Work as a member of a team with other professional and own discipline to, plan, organise and implement projects, programmes with emphasis on the use of the process in problem-assessment and problem solving; and
3. Development of professional attitudes, conducive to work with individual families groups and communities, leading gradually to an awareness of self as a professional person.

Efforts will be made to work out objectives in each semester for every student in field-practicum according to the nature and services of the agency and his performance will be evaluated accordingly.

Field Work Objectives for 3rd and 4th Semesters

1. Development of knowledge of:
 - (a) Complexity/pathological patterns of behaviour among individuals, families, groups and communities.
 - (b) The interaction of the micro and macro systems and their effect on vulnerable groups systemic factors in problem identification and assessment.
 - (c) Social policy, planning, social change as major factors in shift of the locus from the remedial to development work with such groups.
2. Development of skills to:
 - (a) Critically analyze and evaluate problems/needs of individuals, families, groups and communities in the context of the micro and macro systems so as to :
 - (i) use of an integrated approach in problem solving.
 - (ii) mobilize individuals/groups for development work,
 - (iii) enhance functioning of the change agent system to initiate new services and participate in the planning and policy making process of the organization where the students are placed for field-work.
 - (iv) use leadership in the interdisciplinary team and adequately interpret and social worker's role.
 - (b) Supervise staff and volunteers in the agency.
 - (c) Work as a member of research team/initiate agency based small studies for assessment of problem/ need/delivery of services.
 - (d) Initiate projects/programmes in the agency and give leadership to others in implementation.
3. Development of professional attitudes, conducive to work with individuals, families, groups and communities, leading gradually to an awareness of self as a professional person.
4. Develop identification with self as a professional working with maturity and understanding with people having different value orientations and sell as an agency of change.

Efforts will be made to work out objectives in each semester for every student in field-practicum according to the nature and services of the agency and his performance will be evaluated accordingly.

Components of Field work

Concurrent Field work

The supervised field work will be of 16 hrs per week, (twice a week, 8 hours per day) for 25 days in each semester. Attendance in all the days of field work is must for every student. In exceptional cases only on genuine grounds four field Work days are allowed for compensation in each semester on the recommendation of the supervisor and with the information to the chairman and field work coordinator.

The performance of student is discussed with his/her supervisor weekly on the basis of his/her weekly fieldwork reports and is evaluated at the end of each semester. As a professional institution, the department attaches great importance to field work which is expected to develop, in the students, a sense of proper work habits and responsibility. In addition to concurrent field work, students will attend the following field programmes as integral part of their field practicum for which they will be assessed.

- (i) **Organizational Visits:** In the 1st semester, organizational visits of minimum three days duration will be organized for 25 marks which will be awarded to the students by the respective teachers on the basis of their performance, organizing abilities, participation in agency discussions, responsibilities shared and behavior during visit. The observational visits will be accompanied and supervised by at least one faculty member, as per university rules.
- (ii) **Summer Placement:** The students of 2nd semester will be required to undergo Summer Placement of 30 working days, after they have appeared in their theory examination. During the Summer Placement the student will work in organization/agency of his/her choice and will perform the functions duly assigned by the Organization/Agency. The students will prepare his daily report, which will be required to submit at the time of internal evaluation. The In-charge of the Organization/Agency will be requested to send a Confidential Report of the quality of work and conduct of the student to the Chairman. This report will also be considered by the teachers of the department while evaluation done at the time of Internal Evaluation. The performance of the students will be judged by all the teachers of the department by holding Internal Viva-Voce examination. The

average of marks awarded by each teacher separately out of total 25 marks earmarked for it will form the final score obtained by the students in Summer Placement.

- (iii) **Field Work Presentation:** All the students of 3rd semester will have to prepare class assignments on the basis of their fieldwork experiences. The Presentations will be in the form of Case/ Group / Community Work Presentations in the area of their respective specialization. The same has to be presented in the class by the students during the tenure of 3rd semester. The faculty member will evaluate the performance of the students on the basis of content and presentation of the assignment and award marks to the students out of 25 marks.
- (iv) **Block Field Work:** After satisfactory completion of concurrent field-work during the two academic years and after the final university examination of 4th Semester, every student will be placed by the Department for block field-work for 30 working days for full time work in an agency outside, Kurukshetra as per specialization opted by students during 2nd year. The Department selects these agencies from amongst a large number spread all over the country, keeping in mind the availability and learning opportunities for the students. All expenses in this connection have to be borne by the students themselves. The students going for block field-work will have to make their own arrangements for boarding and lodging. The Department has no responsibility in this regard. The purpose of Block Field-Work is to broaden the student's perspective of welfare services and provide pre-employment work experience, which should facilitate him to assume professional responsibilities upon graduation. A student will not be eligible for the degree unless he completes the block field-work successfully up to the satisfaction of the Head of the Department.

On the basis of Block Field Work report, observations of block agency supervisor and viva-voce by all the teachers, students will be given marks out of 25. Average marks given by all the teachers will be the final marks for Block placement.

- (v) **Field Work Internal Evaluation:** Keeping in' view the regularity, punctuality, sincerity and responsibility of the students, concerned teacher/ supervisor will assess the student's performance and award marks (out of 25 marks) in each semester on the basis of his/her observation during classroom teaching, field practice and over-all behaviour during the period under assessment.

PROGRAM OUTCOMES OF FACULTY OF **SOCIAL SCIENCE**

PO1 KNOWLEDGE

Demonstrate knowledge of historical emergence, questions asked, and distinctive contributions of the social science disciplines to the analysis of human behavior and social issues.

PO2 PROBLEM SOLVING

Visualize, conceptualize, articulate, and solve complex problems through experimentation and observation using theoretical framework of social science disciplines.

PO3 CRITICAL THINKING

Critically analyze everyday problems faced by the society, evaluate specific policy proposals, compare arguments with different conclusions to a specific societal issue, and assess the role played by assumptions in such arguments.

PO4 SCIENTIFIC ENQUIRY

Develop the capability of defining problems, formulate hypothesis, collect relevant data, develop empirical evidence and interpret the results of such analyses.

PO5 USAGE OF ANALYTICAL TOOLS

Develop the ability to apply appropriate quantitative/qualitative techniques used in social science disciplines along with ICT, softwares etc.

PO6 SPECIALIZATION AND EMPLOYABILITY

Develop deeper understanding, creativity, originality, analytical and critical skills in chosen specialized areas of social science disciplines leading to employability.

PO7 INTERDISCIPLINARY KNOWLEDGE & ADAPTATION

Enhance the ability to integrate as well as synthesize the acquired knowledge within the social sciences and beyond.

PO8 SELF DIRECTED LEARNING

Develop the ability to work independently as well as effectively in the changing environment.

PO9 ETHICS

Articulate and apply ethics, values and ideals that demonstrate awareness of current societal challenges.

PO10 LEADERSHIP

Build skills to work as part of a team and lead others, setting directions and formulating inspiring vision.

PO11 COMMUNICATION

Communicate conclusions, interpretations and implications clearly, concisely and effectively, both orally and in writing for different types of audiences.

PO12 PROJECT MANAGEMENT

Use investigative skills necessary for conducting disciplinary-appropriate projects/ research documents/term papers etc.

PROGRAMME SPECIFIC OUTCOMES OF MASTER OF SOCIAL WORK (MSW)

The students after acquiring Master Degree in Social Work will be able to:-

PSO1	Have in depth knowledge and skills of social work profession and other allied discipline which contribute to social work education.
PSO2	Display analytical and critical thinking in relation to social policies, social issues and programmes related to societal development
PSO3	Develop competencies for research and innovation, problem solving, decision making, autonomous functioning and acquisition of information technology skills
PSO4	Inculcate professional attributes interpersonal and collaboration skills and job skills of social work profession including demonstration of integrity, honesty, responsibility and accountability towards social work profession and client system
PSO5	Develop understanding of diversity and inclusiveness, respect for social justice and human rights environmental consciousness and commitment for community and societal engagement

Semester -1

Paper Code – MSW(C)-101 Society and Current Social Problems

Credits : 04
Max. Marks. : 100
Theory : 80
Internal Assessment : 20
Time- 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO101.1	Understand basic sociological concepts and formations.
CO101.2	Understand various social problems/issues and their impact on the society
CO101.3	Develop competence to critical analyze, contemporary social problem/issues
CO101.4	Learn to apply sociological insight and approaches in social work practice

Unit-I

- Basic sociological concepts: Society- concept and approaches, Association, Institution; Organization; social organization and social disorganization.
- Social institutions: family and marriage; their functioning and impact on life of individuals.
- Social Processes- associative and dissociative.

Unit- II

- Social system: concept, meaning, characteristics, elements and classification.
- Social stratification: caste and class- meaning and nature of social class, development of class, meaning and nature of caste, difference between caste and class.
- Origin of the caste system, merits and demerits of caste system and modern trends of caste system in India.

Unit- III

- Culture and Civilization –meaning, definition, elements and functions of culture, difference between culture and civilization.
- Cultural change and Acculturation.
- Social Change- meaning, nature, causes and a brief orientation to theories of Social Change.
- Social control- meaning, need and means of social control.

Unit- IV

- Social Problems-concept, methods of study, various approaches, causations and remedies
- Major social problems such as poverty, communal tension and Cyber Crime - causes, extent, effect and role of social worker.

- Current social problems- Domestic violence, regionalism, child abuse and trafficking, drug addiction and alcoholism- meaning, definition, causes, effects and role of social worker.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

List of Readings:

- | | |
|--|--|
| 1. Ahuja, Ram. ,2014 | Social Problems in India 3rd Ed. , Rawat Publications, Jaipur |
| 2. Bhushan, V. & Sachdeva, D.R., 2006. | An Introduction to Sociology, Allahabad: Kitab Mahal. |
| 3. Desai, A.R. 1986. | Agrarian Struggles in India after Independence, Oxford University Press Delhi. |
| 4. Deshpande, S. (2014) | The problem of caste. New Delhi: Orient Blackswan. |
| 5. George, Vic, Robert M. Page 2004 | Global Social Problems, Polity Press Combridge. |
| 6. Madan, G.R. 1994. | Indian Social Problems, Vol. I and Vol. II Allied Pub. Pvt. Ltc., New Delhi. |
| 7. Merton, R.K. & Nisbet, R. 1976. | Contemporary Social Problems, Harper and Row, Publishers, New York. |
| 8. Mohanty, Manoranjan 2004 | Class, Caste and Gender, Sage Publications, New Delhi. |

9. Nagla, B. K. (2013) Indian sociological thought: Rawat Publication

10. Parsad, B.K., 2004 Social Problems in India, Anmol Publications, New Delhi.

11. Rawat,H.K.2013 Contemporary Sociology, Rawat Publications, Jaipur

12. Ram Ahuja, 1999. Society in India, Rawat Publications, Jaipur.

13. Sharma, K.L. 1994 Caste and Class in India, Rawat Publication, Jaipur

14. Sharma, K.L. 2011 Culture Stratification and Development. Rawat Publication, Jaipur

15. Singh, Yogendra 1988. Modernization of Indian tradition, Delhi Thomson Press.

16. Weinstein, J. 2011 Social Change, Rawat Publication, Jaipur

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(C)-101
(Society and Current Social Problems)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
101.1	3	2	1	1	-	1	3	2	3	-	-	-
101.2	3	3	3	3	-	2	2	3	2	2	2	2
101.3	3	3	3	3	-	3	2	3	3	2	3	3
101.4	2	3	3	3	-	3	3	3	3	3	3	3
Average	2.75	2.75	2.50	2.50	-	2.25	2.50	2.75	2.75	1.75	2	2

Table 3: CO-PSO matrix for the course MSW(C)-101
(Society and Current Social Problems)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
101.1	3	3	2	2	3
101.2	3	3	3	2	3
101.3	3	3	3	3	2
101.4	3	3	3	3	3
Average	3	3	2.75	2.50	2.75

Paper Code- MSW(C)-102
Human Growth and Development – I

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO102.1	Develop understanding of human behaviour and various factors influencing personality development
CO102.2	Understand the various stages of human growth and development in the life span of individual
CO102.3	Understand major problems related to human behaviour and alternate solutions
CO102.4	Learn to apply psychological insight and approaches in social work practice

Unit- I

- Human growth and development: Concept and principles.
- Biological and social influences on human growth and behaviour (heredity and environment), fulfillment of basic human needs.
- Dimensions of development- physical, motor, cognitive, emotional, social and moral.
- Communication: Concept, principles, process, elements and types.
- Conditions for effective communication. Developing communication skills and effective use of feedback.

Unit-II

- Understanding of human life span: Indian concept of life span (Brahmcharya, grihastha, vanprastha and sanyas).
- Human Psycho-social development (Erikson and Freud)
- Socialization: Concept and factors, role of family, peer group, neighborhood, school, religion and social values in socialization.
- Perception: Nature, perceptual organization, factors influencing perception and role of experience in perception.

Unit- III

- Stages of development: Characteristics, needs, problems, and tasks during developmental stages of infancy, babyhood, child hood (early & late), puberty and adolescence, adult hood (early, middle) and old age, relevance of social work practice during each stages of development.

Unit- IV

- Pre-natal development and anti-natal care, necessary precautions such as medical, nutritional, emotional during prenatal period and preparations for anti-natal care.
- Conflicts and stress: Management and treatment
- Social adjustment: Concept and factors.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

List of Readings:

- | | |
|---|---|
| 1. Beckett, C & Taylor, H, 2019 | Human Growth and Development, FOURTH EDITION, Sage Publications |
| 2. Erikson, E.H. 1963. | Childhood and Society, New York W.W. Norton and Co. |
| 3. Frank S. Freeman, 1965. | Theory and Practice of Psychological testing. Oxford & IBH Publishing Co., New Delhi. |
| 4. Hall, C.S. and Lindzey, G. 1998.
& Campbell, J. B | Theories of Personality, John Wiley and Sons Inc. New York |
| 5. Hilgard Ernest R 1979 | Atkinson, Rital, Introduction to Psychology, Harcourt Brace Jovanovich inc. New York, 1979. |
| 6. Hurlock, Elizabeth B. 1978 | Child Development, McGraw Hill Book Company, London |
| 7. Hurlock, E.A. 1994. | Developmental Psychology: life-span Approach, Tata McGraw Hill, New Delhi. |
| 8. Hurlock E.B., 1992. | Child Growth and Development, Tata McGraw Hill, New Delhi. |
| 9. Hurlock E.B., 1992 | Personality Development, McGraw Hill, New Delhi. |
| 10. Ingleby, E., 2020 | Applied Psychology for Social Work SECOND EDITION, Sage Publications |

11. Koenig,T, Spano.R& Thompson, 2019 Human Behavior Theory for Social Work Practice, Sage Publications
12. Kuppuswamy, B., 1980. An Introduction to Social Psychology, Mumbai: Media Promoters and Pub. Pvt. Ltd.
13. Lindgren. H.C. and Byrne. D., 1971. Psychology: An Introduction to a behavioural Science, New York: McGraw Hill Book Co.
14. Lindzey, G & Aronson, E 1969 The handbook of social Psychology (2nd ED) Vol. II To V Wesley Publishing Co. Massachusetts.
15. Loid Dodge Farnald 2007 Psychology- Six Perspective, Sage Publication New Delhi,
16. Margarete, Parrish.,2012 Social Work Perspectives on Human behaviour, Rawat Publications, Jaipur
17. Myers David G. 2006 Psychology, W H Freeman & Co.
18. Rathus Spencer A. 2006 Psychology: Conecpts and Connections, Wandsworth Publishing Company.
19. Robert A. Baron, 2003. Social Psychology, Prentice Hall of India, New Delhi.
20. Robinson, Lena, 1995 Psychology for social workers, Routledge, London
21. Sanrouck, john W.2007. A Topical Approach to life- Span Development. Tata McGraw Hill, New Delhi.
22. Sharma Rajendra K. & Sharma, Rachna 1997 Social Psychology , Atlantic Publishers,
23. Smith, Lesile 2006 Voneche, J, Jacques, Norms in Human Development, Cambridge University Press.
24. Specht, J . (2017) Personality development across the lifespan. 1st Edition. London: Academic Press
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27. William James 2007 Principles of Psychology, Cosimo Inc. New York
28. William Flexner, 2004. Educational Psychology and Mental Health, Sarup Publication, New Delhi.
29. Walker ,Janet& Horner, Nigel ,2020 Social Work and Human Development SIXTH EDITION, UK: University of Lincoln, Sage Publication

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-102
(Human Growth and Development – I)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
102.1	3	2	2	3	-	3	3	2	2	2	-	-
102.2	3	2	2	3	-	3	3	2	2	2	-	-
102.3	3	2	2	3	-	3	3	2	2	2	-	-
102.4	2	3	3	3	-	3	3	3	2	2	-	-
Average	2.75	2.25	2.25	3	-	3	3	2.25	2	2	-	-

Table 3: CO-PSO matrix for the course MSW(C)-102
(Human Growth and Development – I)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
102.1	3	2	2	2	2
102.2	3	3	2	2	2
102.3	3	3	3	2	3
102.4	3	3	3	2	2
Average	3	2.75	2.50	2	2.25

Paper Code- MSW(C)-103
Social Work Profession, Philosophy and Concepts

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO103.1	Understand the conceptual framework of social work practice
CO103.2	Aware about the historical development of social work in Indian and worldwide perspective and it's role in current scenario
CO103.3	Understand and inculcate the philosophical base of social work practice
CO103.4	Develop necessary skills to practice social work in an ethical & professional manner

Unit- I

- Concept, nature, scope and philosophy of social work.
- Relationship of social work with other social sciences.
- Social work and related concepts- social reform, social welfare, social development, social service, social services, social revolution and social security.

Unit- II

- Social work: basic values, goals and principles.
- Methods of social work.
- Gandhian Social Work, Sarvodaya and Antyodaya.
- Social Work in the changing scenario of Globalization and Liberalization.
- Preventive, curative, rehabilitative and developmental roles of social work profession.

Unit- III

- History of social work in U.K, U.S.A and India.
- Radical social work: concept, philosophy, aims and its relevance.
- New trends in social work practice.
- Definition of social work from Human Rights perspective.
- Problems in practice of social work in India.
- Social work education and present social environment.

Unit- IV

- Concept of occupation and profession, components of profession,
- Social work as a profession.
- Code of ethics of the National Association of social workers (NASW).
- Professional organization at national and international level: their structure, functions and importance.
- Field- practicum in social work; philosophy and objectives.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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- | | | |
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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
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<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-103
(Social Work Profession, Philosophy and Concepts)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
103.1	3	3	3	2	-	2	3	3	2	-	-	-
103.2	3	3	3	3	-	3	3	3	3	-	-	-
103.3	3	2	3	3	-	2	3	3	3	-	-	-
103.4	2	3	3	3	-	3	3	3	3	-	-	-
Average	2.75	2.75	3	2.75	-	2.50	3	3	2.75	-	-	-

Table 3: CO-PSO matrix for the course MSW(C)-103
(Social Work Profession, Philosophy and Concepts)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
103.1	3	3	2	2	3
103.2	3	3	2	2	3
103.3	3	3	3	3	3
103.4	3	3	3	3	3
Average	3	3	2.50	2.50	3

Paper Code – MSW(C)-104
Social Case Work- I

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO104.1	Develop an understanding of case work as a method of social work and appreciate its place in social work practice
CO104.2	Understand the process of social case work practice and the various tools and techniques that facilitates the same
CO104.3	Understand the theoretical system that supports the practice of case work
CO104.4	Develop skills to utilize different intervention models during practice

Unit- I

- Social Case Work: nature, assumptions, values and principles.
- Development of social case work U.K., USA and India
- Concepts in social case work: Human needs, stress, social role and adaptation.
- Components of social case work: person, place, problem & process

Unit- II

- Intake: need and importance, Relationship: nature and ways to establish.
- Ego- functions and defense mechanisms.
- Work with individuals in the context of the family and other sub-systems.
- Referral: its use in social case work.
- Recording: types-Narrative, Process and Problem Oriented Record Keeping (PORK) and format.

Unit- III

- Process of social case work- study, assessment, goal formation, planning, treatment, evaluation, termination and follow-up
- Techniques of social case work: interviewing, support, encouragement, clarification, correcting perception, reality orientation; resource mobilization, home visiting, interpretation, topical shift, logical reasoning.
- Transference and Counter-Transference and their use in case work practice

Unit- IV

- Models of social case Work practice: Problem solving, Psycho- social, Task oriented.
- Rational Emotive Therapy and its use in social case work.
- Discussion on role of case worker from the records in school, family and marriage settings.
- Presentations and discussions on cases and practical questions.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

List of Readings:

- | | |
|---------------------------------------|---|
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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
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<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(C)-104
(Social Case Work- I)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
104.1	3	3	3	3	2	2	2	2	3	2	2	2
104.2	3	3	3	3	3	2	3	3	3	2	2	2
104.3	3	3	3	2	3	2	3	3	3	2	3	2
104.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	2.75	2.75	2.25	2.75	2.75	3	2.25	2.50	2.25

**Table 3: CO-PSO matrix for the course MSW(C)-104
(Social Case Work- I)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
104.1	3	3	3	3	2
104.2	3	3	3	3	3
104.3	3	3	3	3	3
104.4	3	3	3	3	3
Average	3	3	3	3	2.75

Paper Code-MSW(C)-105
Social Group Work- I

Credits : 04
Max. Marks. : 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO105.1	Understand group as a dynamic social entity and a resource for intervention
CO105.2	Understand the process of social group work practice and various tools and techniques that facilitate social group work intervention
CO105.3	Develop an ability to apply group work method in different settings
CO105.4	Develop an understanding about the application of therapeutic approaches in group work

Unit- I

- Group- meaning, definition, characteristics and purpose.
- Major classification of social groups.
- Types of groups in social group work practice.
- Significance of groups in individual life.

Unit- II

- Social group work- meaning, definitions, nature, philosophy, objectives and significance.
- Historical development of social group work.
- Social group work as a method of social work profession and its relationship with other methods of social work.
- Models of social group work.

Unit- III

- Principles of social group work.
- Relevance of guided group interaction in programme planning.
- Skills and techniques of social group work.
- Role of social group worker.

Unit- IV

- Social group work process- group formation, assessment, formulation of objectives, planning, action and termination.
- Stages of group development- planning, beginning, middle and ending stage.
- Practical questions and discussion of group work records in school and community setting.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

List of Readings:

- | | |
|--------------------------------------|---|
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<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-105
(Social Group Work- I)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
105.1	3	3	3	3	2	2	3	3	3	3	2	1
105.2	3	3	3	3	2	2	3	3	3	3	3	3
105.3	3	3	3	2	3	2	3	3	3	3	3	3
105.4	3	3	3	3	2	3	3	3	3	3	3	2
Average	3	3	3	2.75	2.25	2.25	3	3	3	3	2.75	2.25

Table 3: CO-PSO matrix for the course MSW(C)-105
(Social Group Work- I)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
105.1	3	3	3	3	3
105.2	3	3	3	3	3
105.3	3	3	3	3	3
105.4	3	3	3	3	3
Average	3	3	3	3	3

Paper Code -MSW(C)-106
Community Organization & Social Action-I

Credits : 04
Max. Marks. : 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO106.1	Understand the conceptual framework of community work and community mobilization
CO106.2	Enhance analytical understanding of the approaches/models and strategies for community organization practice
CO106.3	Understand the process of community organization practice and various tools and techniques that facilitate community organization practice
CO106.4	Understand the critical issues and problems of community work in India

Unit-1

- Community and community engagement: concept, nature, types and approaches.
- Community Organization- concept, nature, objectives, values, scope, process and related concepts: community work, community development, community action.
- Community organization as a method of social work intervention.

Unit- II

- Principles of community organization
- Strategies in community organization such as bargaining, confronting, collaborating, problem-solving, educating, social advocacy, joint action, persuasion and campaign.
- Skills in and techniques of community organization practice.
- Participative learning and social mapping: concept, approaches and steps; thematic mapping, social mapping, transact walk, resource mapping - natural and human resource mapping.
- Roles of social worker in community organization.

Unit- III

- W. Biddle's enabling/encouraging approach and Saul Alinsky's dynamics of power approach to community organization/development.
- Models of community organization- locality development model, social planning model and social action model.
- Theory of community engagement; school, family and community partnership.

Unit- IV

- Problems in development of community work in India- such as problems of community welfare councils, community chests, public relations and community participation.
- Community based disasters; risk and risk reduction role and responsibilities.

- Practical records in community settings and their discussions.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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**Table 2: CO-PO matrix for the course MSW(C)-106
(Community Organization & Social Action-I)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
106.1	3	3	3	3	2	2	3	2	3	3	2	2
106.2	3	3	3	3	3	2	3	3	3	3	2	2
106.3	3	3	3	2	3	2	3	3	3	3	3	3
106.4	3	3	3	3	3	3	3	3	3	3	2	2
Average	3	3	3	2.75	2.75	2.25	3	2.75	3	3	2.25	2.25

**Table 3: CO-PSO matrix for the course MSW(C)-106
(Community Organization & Social Action-I)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
106.1	3	3	3	3	2
106.2	3	3	3	3	3
106.3	3	3	3	3	3
106.4	3	3	3	3	3
Average	3	3	3	3	2.75

Paper Code -MSW(C)-107
Field Work Practicum

Credits : 08
Max. Marks. : 200
External Viva-Voce: 150
Internal Assessment: 50

Course Outcome:-

At the end of the course, the students will be able to:-

CO107.1	Develop knowledge about socio-economic background and the living condition of the vulnerable groups and the problems confronted by them
CO107.2	Learn Problem-solving techniques utilized in the specific area of work of the agency where student is placed
CO107.3	Develop skills to analyse perceptions of people/community regarding their problems, needs and issues affecting their life
CO107.4	Develop professional attitudes, conducive to work with individual, families, groups and communities, leading gradually to an awareness of self as a professional person.

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-107
(Field Work Practicum)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
107.1	3	3	3	3	2	2	3	3	3	3	3	3
107.2	3	3	3	3	2	2	2	3	3	3	3	2
107.3	3	3	3	3	3	3	3	3	2	3	3	2
107.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	2.50	2.50	2.75	3	2.75	3	3	2.50

Table 3: CO-PSO matrix for the course MSW(C)-107
(Field Work Practicum)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
107.1	3	3	3	3	3
107.2	3	3	3	3	3
107.3	3	3	3	3	3
107.4	3	3	3	3	3
Average	3	3	3	3	3

Table 4: CO-PO-PSO mapping matrix for all the courses of Master of Social Work- Ist Semester

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
MSW(C)-101	2.75	2.75	2.50	2.50	-	2.25	2.50	2.75	2.75	1.75	2	2	3	3	2.75	2.50	2.75
MSW(C)-102	2.75	2.25	2.25	3	-	3	3	2.25	2	2	-	-	3	2.75	2.50	2	2.25
MSW(C)-103	2.75	2.75	3	2.75	-	2.50	3	3	2.75	-	-	-	3	3	2.50	2.50	3
MSW(C)-104	3	3	3	2.75	2.75	2.25	2.75	2.75	3	2.25	2.50	2.25	3	3	3	3	2.75
MSW(C)-105	3	3	3	2.75	2.25	2.25	3	3	3	3	2.75	2.25	3	3	3	3	3
MSW(C)-106	3	3	3	2.75	2.75	2.25	3	2.75	3	3	2.25	2.25	3	3	3	3	2.75
MSW(C)-107	3	3	3	3	2.50	2.50	2.75	3	2.75	3	3	2.50	3	3	3	3	3

Semester-II

Paper Code-MSW(C)-201

Social Justice and Social Legislation in the New Millennium (21st Century)

Credits : 04

Max. Marks. 100

Theory : 80

Internal Assessment : 20

Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO201.1	Understand the conceptive framework of social justice and inequality pertaining to Indian society
CO201.2	Understand the basic elements of social security, its methods, programmes and problems
CO201.3	Enhance analytical understanding of the human rights, social legislations and their implications
CO201.4	Develop Skills for Social Work Intervention with respect to social justice and human rights

Unit-I

- Social Justice- Concept, meaning and scope.
- Issues of social Justice in Indian society with reference to inequality and socio- political structure.
- Social justice and social work.
- Role of the social worker in relation to humanism and social justice.

Unit- II

- Social security: concept, meaning, objectives, basis and scope.
- Methods of social security: social assistance programme in India especially in relation to old age, unemployment, widowhood and disability.
- Social insurance- concept, characteristics and significance.
- Legal Aid- concept, need, scheme and problems.
- Lok- Adalat- concept and meaning.

Unit- III

- Concepts of Rights, Human rights: concept, characteristics and its classification.
- U. N. Declaration of Human Rights, 1948
- National Human Rights Commission, State Human Right Commission: Structure, functions and role.
- Constitutional provisions related to human rights and their implications.
- Criminal justice- nature and agencies: prosecutions, judiciary and correction

Unit- IV

- Social Legislations and social work.
- The Hindu Marriage Act, 1955(related to marriage and divorce)
- The Adoptions and Maintenance Act, 1956.
- The Dowry Prohibition Act, 1961
- The Consumer Protection Act, 1986
- The Right to Information Act, 2005.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

List of Readings:

- | | | |
|-----|-------------------------|---|
| 1 | Bagchi, S.S.2015 | Human Rights and the Third World, Rawat Publications, Jaipur |
| 2. | Buxi Uperdra (2011) | Perspectives in Development; Law, the Crises of Indian Legal System, Vikas Publication, New Delhi |
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| 4 | Gangrade, K.D.(1978.) | Social Legislation In India Vol. 1 & 2, Concept Publishing Co. New Delhi. |
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| 6 | Hallen G.C. (1967) | Dynamics of social Security, Rastogi Publication, Meerut. |
| 7 | Social Institute (1992) | Legal Education Series(vol 34), Indian Social Institute, Delhi. |
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15. The adoption and maintenance Act, 1956 (Bare Act -2012) University Law Publishing Co. Pvt. Ltd. ,Delhi
16. The Dowry Prohibition Act. 1961, (Bare Act-2012.) Universal Law Publication Co. Pvt. Ltd., Delhi
17. The Consumer Protection Act. 1986, (Bare Act- 2012.) Universal Law Publishing Co. Pvt. Ltd. ,Delhi
18. The Right to Information Act. 2005 (Bare Act.-2012) Universal Law Publishing Co. Pvt. Ltd. ,Delhi
19. Velayutham, K. S. 1998 Social Legislation and Social Change, Vazhavaludan Publication , Chennai

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-201
(Social Justice and Social Legislation in the New Millennium (21st Century)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
201.1	3	2	2	2	-	2	3	2	3	-	2	-
201.2	3	3	3	3	-	2	2	2	3	-	3	-
201.3	3	3	3	3	-	3	3	3	2	-	3	-
201.4	3	3	2	2	-	3	3	3	2	-	3	-
Average	3	2.75	2.50	2.50	-	2.50	2.75	2.50	2.50	-	2.75	-

Table 3: CO-PSO matrix for the course MSW(C)-201
(Social Justice and Social Legislation in the New Millennium (21st Century)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
201.1	3	2	2	3	3
201.2	3	3	3	2	3
201.3	3	3	2	3	3
201.4	3	2	3	3	3
Average	3	2.50	2.50	2.75	3

Paper Code-MSW(C)-202
Human Growth and Development- II

Credits : 04
Max. Marks : 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO202.1	Understand the fundamental components of Psychology and its linkage to social work practice
CO202.2	Gain insight into factors contributing to development of personality
CO202.3	Understand various theories of personality and its implication on social work practice
CO202.4	Acquire analytical ability to assess human behaviour and social work intervention

Unit-I

- Motivation: Concept, nature, factors and motivational cycle, theories of motivation (instinct, incentive, drive, Humanistic and arousal)
- Attitude: Nature, formations and its influence on human behavior.
- Attitudinal change: Learning and dissonance theories of attitude change.
- Public opinion and prejudice: Formation, factors and change. Role of publicity and propaganda in formation and change of public opinion and prejudice.

Unit- II

- Personality: Concept, definitions, and nature.
- Brief discussion of the theories of personality and its implications on social work practice, such as psychodynamic (Freudian and Adler), behavioral (Classical and Instrumental conditioning), humanism (Rogers and Maslow) .

Unit- III

- Attention: Concept and nature.
- Learning: Meaning and nature
- Memory: Nature and types
- Forgetting: Meaning and nature
- Collective behaviour: Concept and meaning, crowd behaviour, audience and mob.
- Theories of collective behaviour.

Unit-IV

- Intelligence: Definition, nature, uses and assessment.
- Creativity: Nature and use of creative thinking in social work practice.
- Emotional intelligence: Definition, nature, components and assessment of emotional intelligence.
- Personality problems: Assessment of personality and relevance of Rorschach and TAT in assessment of personality.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

List of Readings:

- | | |
|---|--|
| 1. Anastasi, A., 1987. | Psychological Testing, New York Macmillan, Revised Edition. |
| 2. Baron, Rober 1997 | Byrne, Donn, Social Psychology, Allyn And Bacon, Boston. |
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& Campbell. J. B | Theories of Personality, John Wiley and Sons Inc. New York |
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| 10. Nevid Jeffrey S. Psychology 2007 | Concepts and Applications, Houghton Mifflin Co. |
| 11. Rathus Spencer A. 2006 | Psychology: Concepts and Connections, Wadsworth Publishing Company. |
| 12. Sahejpal Prem, Bahera Pushpita. 2012 | Social Psychology. Tata McGraw Hill, New Delhi |

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15. Weiner, E.A. and Stewart B.J.1984. Assessing Individuals; Psychological and Educational Tests and Measurement. Boston: Little, Brown and Co.
16. Shetgovekar,S,2019 An Introduction to Social Psychology FIRST EDITION, Sage Publications

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
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<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-202
(Human Growth and Development – II)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
202.1	3	3	2	3	-	3	3	2	3	-	2	-
202.2	3	3	3	2	-	3	3	3	3	-	2	-
202.3	3	3	3	3	-	2	3	3	3	-	3	-
202.4	3	3	3	3	-	3	3	3	2	-	3	-
Average	3	3	2.75	2.75	-	2.75	3	2.75	2.75	-	2.50	-

Table 3: CO-PSO matrix for the course MSW(C)-202
(Human Growth and Development – II)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
202.1	3	2	2	3	3
202.2	2	2	2	2	2
202.3	3	2	3	2	2
202.4	2	3	3	2	3
Average	2.50	2.25	2.50	2.25	2.50

Paper Code- MSW(C)-203
Health Care: Needs and Services

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO203.1	Understand the changing concept of health and hygiene as an aspect of social development
CO203.2	Develop a critical perspective of healthcare services and programmes in the context of health scenario in the country
CO203.3	Understand basic common ailments, diseases caused by virus and bacteria affecting common people
CO203.4	Gain understanding of relevance, domains and nature of social work intervention in health settings

Unit-I

- Health-concept and nature.
- Hygiene: personal and environmental, need and importance.
- Malnutrition: concept, causes and symptoms. Balanced diet: Concept & Importance.
- Main systems of body.
- Immunity and immunization of children.
- First Aid- concept and importance

Unit- II

- Common ailments and diseases: symptoms, causes, prevention and control of diseases caused by viruses: measles, chickenpox, polio and Covid 19.
- Diseases caused by parasites: scabies, malaria and intestinal worms.
- Sexually Transmitted Diseases, HIV and AIDS,

Unit- III

- Diseases caused by bacteria: symptoms, causes, prevention and control of whooping cough, diphtheria, typhoid, cholera and Tuberculosis.
- Diseases: plague, dengue, hepatitis.
- Common diseases of childhood: causes, symptoms, prevention and control of diarrhea, dysentery, common cold, jaundice.

Unit- IV

- Preventive and social medicine: concept and meaning.
- Programmes for controlling communicable diseases and role of IEC (Information, Education and Communication)
- Health services in Haryana and India.
- Maternal and child health services.
- National Health Policy, NRHM.
- Primary Health Care: organization and functions.
- Role of medical social worker.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

List of Readings:

- | | |
|-------------------------------------|--|
| 1. Banarjee, G.R., 1950 | Social Service Department in Hospital its Organization and Functions, Mumbai; Tata Institute of Social Sciences. |
| 2. Bartalatt, Harriet; M. 1961. | Social Work Practice in the Health Field, New York; National association of Social Workers. |
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| 8. Rao, Dr. K.N., 1969. | Health Services Public Health in Encyclopedia of Social Work in India, Vol. 1, India: Publication Divn. |
| 9. Singh, Surendra and Mishra, P.D. | Health & Diseases: Dynamics and Dimensions: Royal Book Co. Lucknow. |

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
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<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(C)-203
(Health Care: Needs and Services)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
203.1	3	2	2	2	-	2	3	3	3	-	3	-
203.2	2	3	3	2	-	3	3	2	2	-	3	-
203.3	3	3	2	2	-	2	2	3	3	-	2	-
203.4	2	2	2	3	-	3	3	2	3	-	3	-
Average	2.50	2.50	2.25	2.25	-	2.50	2.75	2.50	2.75	-	2.75	-

**Table 3: CO-PSO matrix for the course MSW(C)-203
(Health Care: Needs and Services)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
203.1	2	3	2	2	2
203.2	3	3	3	2	2
203.3	2	2	2	2	2
203.4	3	3	2	3	3
Average	2.50	2.75	2.25	2.25	2.25

Paper Code-MSW(C)-204
Social case Work- II

Credits : 04
Max. Marks. :100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO204.1	Develop theoretical understanding to work with individuals and families
CO204.2	Understand the process of social case work practice and the various tools and techniques that facilitates the same
CO204.3	Understand the theoretical systems that support the practice of case work
CO204.4	Understand the Indian philosophical concepts in social case work practice

Unit-I

- Social case work, counselling and psychotherapy.
- Techniques of intervention: reflective discussion in current person situation configuration, dynamic and developmental factors.
- Development and use of Professional Self.

Unit-II

- Authority in social casework: nature, types, uses and techniques.
- Crisis: meaning and types of crisis, crisis intervention.
- Role of social case worker: role of social and emotional intelligence in problem solving.

Unit- III

- Interpersonal skills: nature and types.
- Considerations in social case work with children.
- Family case work.
- Behaviour Modification: Theory and its use in case work practice
- Various theoretical orientations in social casework: Gestalt, System approach, Ecological Perspective

Unit- IV

- Indian Philosophical concepts in practices of social casework (Brahma, Vishnu, Mahesh), three debts, three gunas, Anekantwad.
- Discussion of role of social case worker with the records from health, psychiatric and correctional administration settings.
- Discussion of cases and practical questions with reference to children with problem, women, persons with disability and elderly.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

List of Readings:

- | | |
|---------------------------------------|---|
| 1. Aptekar, H.R. 1955. | Dynamics of Case Work and Counseling. Houghton Mifflin, MSS. |
| 2. Biestek, F.P. 1970. | The Case Work Relationship: London: Unwin University Books, VI Impression. |
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- 22.Upadhyay, R.K. 1991. Samajik Vayaktik Karya (Hindi) Haryana Sahitaya Academy, Chandigarh.
23. Upadhyay, R.K. 1993. Indian Philosophical Concepts in Clinical Social work, Kurukshetra Press, Kurukshetra.
24. Upadhyay, R.K. 2003. Social Case Work, Rawat publications, New Delhi, Jaipur
25. Woods Mary, Hollis F. 1999 Casework: A Psychosocial Therapy McGraw-Hill, New York.

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-204
(Social Case Work- II)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
204.1	3	2	2	2	-	2	3	3	3	-	3	-
204.2	2	3	3	2	3	3	3	2	2	-	3	-
204.3	3	3	2	2	3	2	2	3	3	-	2	-
204.4	2	2	2	3	2	3	3	2	3	-	3	-
Average	2.50	2.50	2.25	2.25	2	2.50	2.75	2.50	2.75	-	2.75	-

Table 3: CO-PSO matrix for the course MSW(C)-204
(Social Case Work- II)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
204.1	2	3	2	2	2
204.2	3	3	3	2	2
204.3	2	2	2	2	2
204.4	3	3	2	3	3
Average	2.50	2.75	2.25	2.25	2.25

Paper Code -MSW(C)-205
Social Group Work- II

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO205.1	Develop theoretical understanding of group dynamics in social group work practice
CO205.2	Develop an understanding of programme planning and development in social group work practice
CO205.3	Develop an understanding about the application of therapeutic approaches in group work practice
CO205.4	Develop an ability to apply group work method in different settings

Unit-I

- Group dynamics- concept, principles, dimensions and theoretical orientation with reference to field theory, psycho- dynamic and system approach.
- Group cohesiveness-concepts and its relationship with group effectiveness.

Unit-II

- Programme- concepts, principles and its importance in social group work.
- Programme planning- concepts skill and basis.
- Programme development process.
- Social group work practice in agency settings.

Unit- III

- Group Therapy- concept and method like training group, psycho-therapy, Psycho- drama and play therapy.
- Leadership- concept and theories.
- Skills and tasks of group leader.

Unit- IV

- Evaluation and monitoring in social group work- importance, types and methods.
- Recording in social group work- types, principles, structure and importance in different stages of group work.
- Social Group work practices in different setting- health, psychiatric, alcoholic and addicts.
- Practical questions and discussion of records of each settings.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).

- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

List of Readings:

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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(C)-205
(Social Group Work- II)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
205.1	3	3	2	3	2	2	3	3	3	2	3	-
205.2	2	3	3	3	3	3	3	3	3	3	3	-
205.3	3	3	3	2	3	3	3	2	3	2	3	-
205.4	3	2	2	2	2	3	3	2	2	2	2	-
Average	2.75	2.75	2.50	2.50	2.50	2.75	3	2.50	2.75	2.25	2.75	-

**Table 3: CO-PSO matrix for the course MSW(C)-205
(Social Group Work- II)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
205.1	3	2	2	3	3
205.2	3	3	3	2	2
205.3	2	2	2	3	2
205.4	2	3	3	3	3
Average	2.50	2.50	2.50	2.75	2.50

Paper Code-MSW(C)-206
Community Organization & Social Action - II

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO206.1	Gain critical insight of the various current developmental programmes
CO206.2	Understand the critical issues of local self government and community power structure in Indian context
CO206.3	Understand the concept, process, ideas and model/approaches of social action and mass communication
CO206.4	Understand the concepts, context, perspectives types and features of social movements in India

Unit-I

- Rural and Urban Development- meaning, concept, scope and Current Developmental programmes
- Slum Community: concept, characteristics, problems and current schemes and programmes for slum dwellers. Role of Social Worker in Slum Community.
- Study of rural institutions: Engagement with School, Street Committee, Health Centre, Panchayat and Self Help Groups.

Unit- II

- Community Project and Participatory Rural Appraisal: Features, Techniques and uses.
- Introduction to Local Self- Government (Rural &Urban)- meaning, attributes, organization and function.
- 73rd & 74th Amendments of India Constitution.
- Community Power Structure – concept, sources and its importance for community organization.

Unit- III

- Community Empowerment-concept, principles, process and barriers
- Different types of conflicts like communal, regional and caste conflicts.
- Social Action- concept, strategies, steps and models
- Social Movements - Narmada Bachao Andolan, Chipko Movement, J. P Movement in Bihar.

Unit- IV

- Mass communication-concept and methods
- Models of mass communication.

- Use of mass media for community organization/social action.
- Discussion on practical records in different community setting.
- Role of Community Based Organizations in community organization/ community development.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(C)-206
(Community Organization & Social Action-II)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
206.1	3	3	3	2	-	3	3	3	3	2	2	-
206.2	3	3	3	3	-	3	2	3	3	3	3	-
206.3	2	2	2	2	-	3	3	3	3	3	3	-
206.4	3	3	3	3	-	3	3	3	3	3	3	-
Average	2.75	2.75	2.75	2.50	-	3	2.75	3	3	2.75	2.75	-

**Table 3: CO-PSO matrix for the course MSW(C)-206
(Community Organization & Social Action-II)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
206.1	3	3	2	3	3
206.2	2	3	3	3	3
206.3	3	3	3	3	3
206.4	3	3	3	3	3
Average	2.75	3	2.75	3	3

Paper Code -MSW(C)-207
Field Work Practicum

Credits : 08
Max. Marks. : 200
External Viva-Voce: 150
Internal Assessment: 50

Course Outcome:-

At the end of the course, the students will be able to:-

CO207.1	Develop skills to work with individuals, families, groups and communities to identify the need for an integrated approach to problem solving
CO207.2	Identify and utilize the community resources
CO207.3	Work as a member of a team along with other professionals, paraprofessional, different discipline to, plan, organize and implement projects/programmes with emphasis to proper use of the process in problem-assessment and problem solving; and
CO207.4	Develop professional attitudes, conducive to work with individual, families, groups and communities, leading gradually to an awareness of self as a professional person.

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-207
(Field Work Practicum)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
207.1	3	3	3	3	2	3	3	3	3	3	3	3
207.2	3	3	2	2	2	3	3	3	3	2	3	2
207.3	3	3	3	3	3	3	3	3	3	3	3	3
207.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	2.75	2.75	2.50	3	3	3	3	2.75	3	2.75

Table 3: CO-PSO matrix for the course MSW(C)-207
(Field Work Practicum)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
207.1	3	3	3	3	3
207.2	3	3	3	3	2
207.3	3	3	3	3	3
207.4	3	3	3	3	3
Average	3	3	3	3	2.75

Table 4: CO-PO-PSO mapping matrix for all the courses of Master of Social Work – 2nd Semester

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
MSW(C)-201	3	2.75	2.50	2.50	-	2.50	2.75	2.50	2.50	-	2.75	-	3	2.50	2.50	2.75	3
MSW(C)-202	3	3	2.75	2.75	-	2.75	3	2.75	2.75	-	2.50	-	2.50	2.25	2.50	2.25	2.50
MSW(C)-203	2.50	2.50	2.25	2.25	-	2.50	2.75	2.50	2.75	-	2.75	-	2.50	2.75	2.25	2.25	2.25
MSW(C)-204	2.50	2.50	2.25	2.25	2	2.50	2.75	2.50	2.75	-	2.75	-	2.50	2.75	2.25	2.25	2.25
MSW(C)-205	2.75	2.75	2.50	2.50	2.50	2.75	3	2.50	2.75	2.25	2.75	-	2.50	2.50	2.50	2.75	2.50
MSW(C)-206	2.75	2.75	2.75	2.50	-	3	2.75	3	3	2.75	2.75	-	2.75	3	2.75	3	3
MSW(c)-207	3	3	2.75	2.75	2.50	3	3	3	3	2.75	3	2.75	3	3	3	3	2.75

Semester III

Paper Code- MSW(C)-301
Social Policy and Planning: Current Issues and Strategies

Credits :04
Max Marks. 100
Theory : 80
Internal Assessment : 20
Time : 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO301.1	Understand the social policy in the perspective of the national goals as stated in the constitution.
CO301.2	Recognize the linkage between the developmental issues and social policy, plans and programmes
CO301.3	Gain knowledge of policy analysis and the policy formulation process
CO301.4	Understand the relevance of social policy and planning to social work practice

Unit-I

- Social Policy: concept, objectives, determinants and steps.
- Values underlying social policy based on Constitutional provisions (i.e. Directive Principles of State Policy, Fundamental Rights and Fundamental Duties).
- Instruments of Social Policy.
- Models of Social Policy – Residual welfare, unified, integrated, sectoral, industrial achievement and institutional redistributive model and their applicability to the Indian situation.

Unit-II

- Social policy formulation: contribution of research, interest groups and role of professional social worker.
- Critical review of policies concerning Education, Health, Population, Family welfare and Housing.
- Methods of evaluation of social policy.

Unit-III

- Social Planning: conceptual and operational aspects, scope, levels, steps and strategies.
- Monitoring and evaluation of social planning.
- Five year plans in India – Salient features with an emphasis on the objectives of social justice, education and family welfare.

Unit-IV

- Economic planning, welfare planning, developmental planning: meaning importance and differences.
- Need of decentralization and people's participation.
- Machinery and procedure of planning in India at centre and state levels.
- Niti Aayog - organization, structure and functions.
- State Planning Boards – organization, structure and functions.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

Bibliography:

- | | |
|--|---|
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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-301
(Social Policy and Planning: Current Issues and Strategies)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
301.1	3	3	3	2	-	3	3	3	3	3	3	2
301.2	3	3	3	3	3	3	3	2	3	2	3	2
301.3	3	2	3	3	3	2	3	3	3	3	3	3
301.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	2.75	3	2.75	2.25	2.75	3	2.75	3	2.75	3	2.5

Table 3: CO-PSO matrix for the course MSW(C)-301
(Social Policy and Planning: Current Issues and Strategies)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
301.1	3	3	3	3	3
301.2	3	3	3	3	3
301.3	3	3	3	3	3
301.4	3	3	3	3	3
Average	3	3	3	3	3

Paper Code-MSW(C)-302
Administration of Welfare Services

Credits :04
Max. Marks. 100
Theory : 80
Internal Assessment 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO302.1	Understand the administrative mechanism and processes in the area of welfare and development.
CO302.2	Formulate service project proposal as per the welfare needs of the society
CO302.3	Understand the functioning of non-profit organizations & their social and legal aspects
CO302.4	Practice Social Work Knowledge in the administration of welfare services

UNIT-I

- Conceptual understanding of administration, social administration, welfare administration, public administration and social work administration.
- Social Welfare Administration: Definition, features, scope, elements and principles.
- Registration of an Organization as a Society, Trust and Company.
- Administrative processes: Policy making, planning, organizing, staffing, directing, supervising, coordination, budgeting, accounting, decision making, monitoring and evaluation.

UNIT-II

- Project Formulation: Concept, steps and limitations.
- Formulation of service project proposals, guidelines for effective project formulation.
- Approaches to social administration: Weberian, classical, behaviour, systems, structural and functional.
- Communication: Concept, principles and importance.
- Public relations and mass media: Meaning, importance and methods.
- Problems of voluntary organizations/NGOs and remedies.
- Fund raising and mobilization

UNIT-III

- Overview of functioning of Ministry of Social Justice and Empowerment at Central and State levels.
- Central Social Welfare Board and State Social Welfare Boards: Organizational structure, functions, role and Programmes.

UNIT-IV

- Role of voluntary agencies/NGOs in promotion of welfare services.
- Welfare services to vulnerable groups such as women, children, aged, youth, persons with disability and SCs & STs.
- International Social Welfare: Meaning, need and significance.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-302
(Administration of Welfare Services)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
302.1	3	3	3	3	3	3	3	2	3	2	3	3
302.2	3	3	3	3	3	3	3	3	3	3	3	3
302.3	3	3	3	2	2	3	3	3	3	3	3	2
302.4	3	3	3	3	3	2	3	3	3	3	3	3
Average	3	3	3	2.75	2.75	2.75	3	2.75	3	2.75	3	2.75

Table 3: CO-PSO matrix for the course MSW(C)-302
(Administration of Welfare Services)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
302.1	3	3	3	3	3
302.2	3	3	3	3	3
302.3	3	3	3	3	3
302.4	3	3	2	3	3
Average	3	3	2.75	3	3

Paper code- MSW(C)-303
Social Work Research and Statistics-I

Credits : 04
Max. Marks 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO303.1	Understand the nature, scope and significance of research in social work practice.
CO303.2	Develop an ability to see the linkages between practice, research, theory and their role in enriching one another
CO303.3	Familiarize with the nature of social science research and its application in the study of social phenomena
CO303.4	Learn the process of Data collection, organization, presentation, analysis and report writing

Unit – I

- Scientific Study: meaning, characteristics and steps in Scientific Study
- Concepts and variables: Meaning and Definitions. Objectivity and Subjectivity
- Social Phenomena- Nature, levels of measurement and problems in measurement of Social Phenomena
- Social Research: meaning, nature, objectives, need and importance
- Baseline Survey and Social Survey.
- SAGE (Situation Analysis and Goal Establishment) – as a tool of research and MIS

Unit– II

- Types of Social Research- Historical, Descriptive and Experimental
- Scaling Techniques – Bogardus, Sociometric, Thurston and Likert – an overview
- Research Proposals: steps and importance
- Identification, sources and criteria of Research Problem
- Review of related Literature- significance and sources

Unit III

- Hypothesis – meaning, characteristics, types, formulation and uses
- Sampling – meaning, need, steps, characteristics, pre-testing and types
- Tools of Data Collection: characteristics, types, uses and limitations of Questionnaire, Interview, Observation, Case Study and Focused Group Discussion.
- Analysis of data – meaning, significance and process

Unit-IV

- Statistics: meaning and significance.
- Primary and secondary sources of data
- Classification and Tabulation of data: types and importance.
- Diagrammatic and Graphic presentation of data: meaning, significance and limitation.
- Graphs of frequency distribution- Histogram, Frequency Polygon, Smooth Frequency Curve and Ogive.
-

Note

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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- | | | |
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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-303
(Social Work Research and Statistics-I)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
303.1	3	3	3	3	3	3	3	3	3	2	3	3
303.2	3	3	3	3	3	3	3	2	3	3	3	3
303.3	3	3	3	3	3	2	3	3	3	3	3	3
303.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	2.75	3	2.75	3	2.75	3	3

Table 3: CO-PSO matrix for the course MSW(C)-303
(Social Work Research and Statistics-I)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
303.1	3	3	3	3	3
303.2	3	3	3	3	3
303.3	3	3	3	3	3
303.4	3	3	3	3	3
Average	3	3	3	3	3

Paper Code- MSW(C)-304
Mental Health Care, Services and Counseling

Credits **04**
Max Marks. **100**
Theory **: 80**
Internal Assessment : **20**
Time: **3 Hours**

Course Outcome:-

At the end of the course, the students will be able to:-

CO304.1	Understand the conceptual framework of mental health and Psychiatry.
CO304.2	Gain knowledge of the minor and major psychiatric disorders, their causes, symptoms, diagnosis, manifestations, treatment and management
CO304.3	Familiarize with the treatment and rehabilitation modalities in mental illness
CO304.4	Understand the relevance of social work interventions in mental health problems

UNIT – I

- Mental Health, Psychopathology, and Psychiatry: concept, meaning and scope.
- Concept of normality and abnormality.
- Etiology of mental disorders.
- Classification of mental disorders: WHO approach (ICD-10) and American Psychiatric Association approach (DSM-IV & IV-TR).
- Psychoneurotic reactions: Anxiety disorders, Obsessive-compulsive reactions, Phobic reactions, Delirium and Dementia; Alzheimer's disease.
- Depressive reactions: prevalence, causes, symptoms, types & treatment
- Mood disorders and personality disorders: symptoms, types and treatment
- Somatoform disorders: conversion disorder (Hysteria), Hypochondriasis, Pain disorders; causes symptoms, types and treatment.

UNIT – II

- Psychotic disorders- Schizophrenia: prevalence, symptoms, types and treatment
- Paranoid reactions- symptoms and treatment.
- Intellectual disability: causes, types, management, prevention and rehabilitation
- Services for Mental Health, National Mental Health Programme: objectives, progress and problems

UNIT – III

- Substance abuse and dependence: meaning, definition, nature and extent of the problem
- Types of addictive substances: natural, synthetic, narcotics, stimulants and depressants. Nature, symptoms, short-term effects and long-term effects of substance abuse.
- Theories of addiction: physiological, psychological, sociological and cultural theories.
- Alcohol dependence and Alcoholism: causes, symptoms, long term and short-term effects. Phases of alcohol addiction.
- Socio-economic implications of addiction and rehabilitation

UNIT – IV

- Mental Healthcare Act, 2017
- Therapeutic community: concept and use. Community Psychiatry.
- Rehabilitation, prevention and promotion of mental health Treatment

- Rehabilitation of Drug addicts. .
- Counseling – meaning, definition, Process and types: directive and non-directive.
- Marriage counseling and Drug Counseling: concept and process. Industrial workers and employees counseling. Characteristics and traits of a good counselor
- Role of Social Worker individually as well as part of a team.
- Yoga and Meditation and other indigenous therapeutic measurers.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
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<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(C)-304
(Mental Health Care, Services and Counseling)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
304.1	3	3	3	3	2	3	3	3	3	2	3	2
304.2	3	3	3	3	3	3	3	3	3	3	3	3
304.3	3	3	3	3	3	3	3	3	3	3	3	3
304.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	2.75	3	3	3	3	2.75	3	2.75

**Table 3: CO-PSO matrix for the course MSW(C)-304
(Mental Health Care, Services and Counseling)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
304.1	3	3	3	3	3
304.2	3	2	3	3	3
304.3	3	3	3	3	3
304.4	3	3	3	3	3
Average	3	2.75	3	3	3

Group-I
Paper Code –MSW(E)-305

Human Resource Management and Industrial Relations- I

Credits : 04
Max. Marks. : 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO305.1	Understand the basic conceptual framework, current trends and challenges in Human Resource Management and Human Resource Development.
CO305.2	Enhance analytical understanding of the Human Resource Management and Industrial Relation practices followed in industries
CO305.3	Develop necessary skills for industrial social work practice
CO305.4	Understanding issues and emerging terms in Industrial Relation in contemporary industrial environment

UNIT – I

- Human Resource Management: meaning, definition, objectives, scope and significance.
- Difference between personnel Management, Human Resource Management and Human Resource Development.
- Functions of Human Resource Management.
- Recent trends of Human Resource Management and challenges in India.

UNIT – II

- Human Resource Planning: definition, objectives, need and importance.
- Levels of Human Resource Planning.
- Human Resource Planning Process: its problems and pre-requisites of effective Human Resource Planning.
- Recruitment: meaning, definition, process, sources, methods and techniques
- Selection: meaning, definition and its process.
- Psychological Tests, Interview, Induction, Placements, Promotion, Demotion and transfer.

UNIT – III

- Training: meaning and concept, need and importance, steps and methods of training programme.
- Executive Development: meaning and concept, need and importance, steps and methods of development programme.
- Career Planning, Career Development and Succession Planning: meaning, concept, stages and process.
- Industrial Health and Safety.

UNIT – IV

- Job Analysis and Design: concept, objectives, process and methods.
- Job Evaluation: concept, objectives, process and methods of job evaluation.
- Performance and Potential Appraisal: concept, objectives, process and methods of Performance Appraisal.
- Industrial Relations: concept, scope, objectives, importance and its Approaches.

- Key Issues and emerging trends in industrial relations.

Note :

- The examiner will set 9 questions in all.
- Candidate shall be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering whole units, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each unit. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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Table 1: Scale of mapping between COs and POs/PSOs

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<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(E)-305
(Human Resource Management and Industrial Relations –I)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
305.1	3	2	3	3	3	3	3	3	3	3	3	3
305.2	3	3	3	3	3	3	3	3	3	3	3	3
305.3	3	3	3	3	3	3	3	3	3	3	3	3
305.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	2.75	3	3	3	3	3	3	3	3	3	3

**Table 3: CO-PSO matrix for the course MSW(E)-305
(Human Resource Management and Industrial Relations –I)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
305.1	3	3	3	3	3
305.2	3	3	3	3	3
305.3	3	3	3	3	3
305.4	3	3	3	2	3
Average	3	3	3	2.75	3

Group-I
Paper Code –MSW(E)-306

Labour Welfare and Labour Legislations- I

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO306.1	Critically understand basic characteristics of Indian labour force in both organized and unorganized sectors.
CO306.2	Know conceptual framework of Labour Welfare and Labour Welfare Administration at national and state level
CO306.3	Understand the process of grievances and its impact on Indian labour force
CO306.4	Critically examine the application of various labour laws

UNIT: I

- Labour: Meaning and Characteristics
- Socio-Economic characteristics of Indian industrial labour force
- Organized and Unorganized labour: meaning, characteristics and problems.
- Globalization and its impact on Indian labour
- Constitutional provisions for the protection/welfare of labour
- Labour welfare administration in india

UNIT: II

- Labour Welfare: concept and scope
- Theories/approaches of labour welfare
- Principles of labour welfare
- Agencies of labour welfare in India
- labour welfare officer- role/status and functions

UNIT: III

- The Factories Act, 1948
- The Trade Unions Act, 1926
- The Contract Labour (Regulation & Abolition) Act, 1970
- The Industrial Employment (Standing Orders) Act, 1946

UNIT: IV

- The Industrial Disputes Act, 1947
- The Employee's State Insurance Act, 1948
- The Employees Compensation Act, 1923 (amended 2010)
- The Employees' Provident Fund and Miscellaneous Provisions Act, 1952

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).

- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(E)-306
(Labour Welfare and Labour Legislations-I)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
306.1	3	2	3	3	2	3	3	3	3	2	3	3
306.2	3	3	3	3	3	3	3	3	3	2	3	2
306.3	3	3	3	2	2	3	2	3	3	3	3	3
306.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	2.75	3	2.75	2.5	3	2.75	3	3	2.5	3	2.75

Table 3: CO-PSO matrix for the course MSW(E)-306
(Labour Welfare and Labour Legislations-I)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
306.1	3	3	3	3	3
306.2	3	3	3	3	3
306.3	3	3	3	2	3
306.4	3	3	3	3	3
Average	3	3	3	2.75	3

Group-II
Paper Code –MSW(E)-307
Family Dynamics: Issues & Needs-I

Credits: 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO307.1	Understand the family as social systems and factors affecting family functioning.
CO307.2	Sharpen the skills, techniques and knowledge required for working with the families
CO307.3	Understand the government and non-government efforts for the welfare of the family and Women specifically
CO307.4	Practice Social Work Knowledge in family settings

UNIT – I

- Family as an Institution – importance and functions
- Impact of Urbanization on Family
- Role of Family in Social Development
- Indian Family – its characteristics viz. power structure, patriarchal norms, values and practices, Changing Functions of Family
- Family Disorganization and Family Problems

UNIT – II

- Husband, Wife and Children relationship; Single Parent Family
- Family Life Education – objectives and process, Family Life Education as a method of Family enrichment
- Family Counseling and Guidance
- Family Welfare Policy and Programmes
- Voluntary and Government agencies for Family Welfare
- Poverty and Family Life

UNIT – III

- Patterns of mothering and child rearing practices in India
- Family Management – nature and principles
- Family Budgeting
- Problems of Girl Child and Women in India
- Legal Rights of Women
- International Beijing Conference, 1995
- Factors affecting the status of women

UNIT – IV

- Role of Women in Development
- Women's Social Organizations
- Institutional Services for Disabled and Destitute Women
- Current socio-economic schemes for women of weaker sections
- Traditional and emerging role of professional social worker in the field of women's development

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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- | | | |
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23. Shrivastva T.M.,1985 : women and law, New Delhi: Intellectual Publishing Housing.

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(E)-307
(Family Dynamics: Issues & Needs-I)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
307.1	3	3	3	3	2	3	3	3	3	3	3	2
307.2	3	3	3	3	3	3	3	3	3	3	3	3
307.3	3	2	3	3	3	3	3	3	3	2	3	3
307.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	2.75	3	3	2.75	3	3	3	3	2.75	3	2.75

Table 3: CO-PSO matrix for the course MSW(E)-307

(Family Dynamics: Issues & Needs-I)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
307.1	3	3	3	3	3
307.2	3	3	3	3	3
307.3	3	3	3	2	2
307.4	3	3	3	3	3
Average	3	3	3	2.75	2.75

Group-II
Paper Code –MSW(E)-308

Developmental Services for Women and Children - I

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO308.1	Understand demographic profile, developmental needs/problems of children in Indian Scenario.
CO308.2	Know institutionalized and non institutionalized services for welfare of children
CO308.3	Sensitize the problem of children in difficult circumstances and social & legal efforts to curb the problem
CO308.4	Understand the issues and challenges related to women in the present scenario and scope of social work intervention therein

UNIT-I

- Child Welfare- concept & philosophy
- Nature and extent of Child development needs; problems of children ; Demographic profile of child in India.
- Evolution of child welfare services in India and abroad.
- Types of Child Welfare Services and the changing trends in child welfare services.
- Nature, extent and causes of the problem of children in difficult circumstances: Destitute, Neglected, disabled, Mentally ill.

UNIT-II

- Role of voluntary organizations in the field of child development.
- Welfare Programmes for the care and protection of the handicapped and destitute children.
- Preventive Services for Children- Child Guidance Clinic, School Social Work
- Non –Institutional Services for Children – Adoption, Foster Care, and Sponsorship Programme.
- Recreational Services for Children – Bal Bhawan, Film, Play centres.

UNIT-III

- Integrated Child Development Scheme- its concept, objectives and services.
- Organizational and Administrative structure of ICDS.
- Child welfare services in Five Year Plans.
- Protective services for children under J.J Act 2000 and Main Provisions of Domestic workers Act, 2008 and POCSO.

UNIT-IV

- Indicators of Women’s position – Issues and Challenges: education, health, employment and work
- Working Mothers – causes, conditions and protections
- Problem faced by Women in - organized sector, unorganized sector, self-employed.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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- 17 Shirimali S S 2008 : Child Development, Rawat Publication, Jaipur
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19. Singh. R.R. 1988 : Social Care of child in Delhi: Policy, And Programme process, Deptt. of Social Work.

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(E)-308
(Developmental Services for Women and Children – I)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
308.1	3	3	2	3	3	3	3	3	3	2	3	3
308.2	3	3	3	2	2	3	3	3	3	3	3	3
308.3	3	3	3	3	3	3	3	3	3	3	3	3
308.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	2.75	2.75	2.75	3	3	3	3	2.75	3	3

**Table 3: CO-PSO matrix for the course MSW(E)-308
(Developmental Services for Women and Children – I)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
308.1	3	3	3	3	3
308.2	3	3	2	3	3
308.3	3	3	3	3	3
308.4	3	3	3	3	3
Average	3	3	2.75	3	3

Group-III
Paper Code –MSW(E)-309
Policy and Development of Health Care-I

Credits :04
Max Marks. 100
Theory : 80
Internal Assessment : 20
Time: 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO309.1	Gain knowledge about the concept of Individual and Community Health.
CO309.2	Critically examine with the policy and programmes of health and mental health care
CO309.3	Develop skills to function as Medical and Psychiatric social workers in child & adult, school, family and psychiatric setups
CO309.4	Understand the relevance of social work interventions in the fields of health and mental health

UNIT-I

- Concept of Health: indicators of individual and community health.
- Health and Social Work, medical social work: meaning, nature, scope.
- Health problems-economic considerations, social and cultural aspects.
- National Health Policy- A critical analysis.
- Identification of needs of health and other related services in India.

UNIT-II

- Major health problems of the disadvantaged such as T.B., cancer, AIDS, covid 19 and heart diseases.
- Psycho-social effects of disabilities on growth and development.
- Specialized services-problems of the deaf, blind and orthopedically disabled.

UNIT-III

- Review of mental health services, economic aspects and effectiveness of various models of treatment.
- Psycho-Social treatment & therapies i.e. RET, Client Centered therapy, Gestalt therapy, Cognitive behaviour therapy.
- Health work in the hospitals: work with patient, individual groups and community, family and collaterals.

UNIT-IV

- Rehabilitation services-concept, nature and services for psychiatric and the physically disabled.
- Prevention of mental health problems and promotion of mental health.
- Role and functions of Social Workers in hospital and in community health.
- Role of Social Workers, individually and as a part of a team of professionals.
- Role of international organizations in health care.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

Bibliography:

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| 2. | Codey, Carol H.,1951 | Social Aspects of Illness, Philadelphia & London : W.B. Saunders Co. |
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| 10. | Simith, Bryan, C.,1978 | Community Health : An Epidemiological Approach : New York : Macmillan Pub. Co. |
| 11. | UNICEF 1976 | Health and Basic Services: Keys to Development New Delhi. |

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(E)-309
(Policy and Development of Health Care-I)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
309.1	3	3	3	2	2	3	3	3	3	3	3	3
309.2	3	3	3	3	3	3	3	3	3	3	3	3
309.3	3	3	3	3	3	3	3	3	3	3	3	3
309.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	2.75	2.75	3	3	3	3	3	3	3

**Table 3: CO-PSO matrix for the course MSW(E)-309
(Policy and Development of Health Care-I)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
309.1	3	3	3	3	3
309.2	3	3	3	3	3
309.3	3	3	3	3	3
309.4	3	3	3	3	3
Average	3	3	3	3	3

Group-III
Paper Code –MSW(E)-310
Psycho-Social Perspectives of Mental Health-I

Credits :04
Max Marks. 100
Theory : 80
Internal Assessment : 20
Time: 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO310.1	Understand the conceptual framework of Mental health and community mental health.
CO310.2	Gain knowledge and develop an understanding of minor & major psychiatric disorders, their causes, symptoms, diagnosis manifestations and management
CO310.3	Develop appropriate skills and attitude required for the practice of mental health and psychiatric social work
CO310.4	Develop a critical perspective of health care and mental health care services and programmes in India and in the world

UNIT-I

- Concept of normality and abnormality.
- Concept of mental health, Epidemiology of mental illness: Extent and prevalence of mental disorders at National and International Levels.
- Classification of mental disorders: WHO approach (ICD-10) and American Psychiatric Association approach (DSM-IV & IV-TR).
- Scope of Psychiatric Social Work and role of Psychiatric Social Worker.

UNIT-II

- Psychoneurotic disorders: magnitude of the problem worldwide and analysis of the problem from different perspectives.
- Delirium and Dementia: Alzheimer's disorder: causes, symptoms & treatment.
- Functional autonomy of nervous system: stroke, Parkinsonism, motor neuron disease, muscular dystrophies, Need for psychosocial intervention in neurological cases.
- Neurotic depression and neurasthenia: symptoms and treatment methods.
- Cerebral Palsy: diagnosis and treatment.

UNIT-III

- Psychotic reactions-Schizophrenia, Manic Depressive Psychosis (MDP) causes, types and treatment.
- Paranoid State: types, symptoms, treatment and rehabilitation
- Mental Retardation causes, types-management and rehabilitation, role of family and parents.
- Personality disorders: nature, causes and types; concept of gender identity.

UNIT- IV

- Practice of Psychiatric Social work in different settings: family services agencies, child welfare agencies, school setting, general hospitals, de-addiction centres.
- Mental Status Examination, case recording, case preparation and presentation.
- Major approaches in psychiatric social work, mobile medical unit, community psychiatry.

- Practice of Psychiatric Social Work in mental hospitals and psychiatric clinics, role of psychiatric social worker.
- Field instructions supervision, recording, documentation and evaluation in psychiatric social worker practice.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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19. World Health Organization, 1992. The ICD-10 Classification of Mental and Behavioral Disorders. Clinical descriptions and diagnostic guidelines, Oxford University Press, Delhi.

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(E)-310
(Psycho-Social Perspectives of Mental Health-I)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
310.1	3	3	3	2	2	3	3	3	3	3	3	3
310.2	3	3	3	3	3	3	3	3	3	3	3	3
310.3	3	3	3	3	3	3	2	3	3	2	3	3
310.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	2.75	2.75	3	2.75	3	3	2.75	3	3

Table 3: CO-PSO matrix for the course MSW(E)-310
(Psycho-Social Perspectives of Mental Health-I)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
310.1	3	3	2	3	3
310.2	3	3	3	3	3
310.3	3	3	3	3	3
310.4	3	3	3	3	3
Average	3	3	2.75	3	3

Group-IV
Paper Code –MSW(E)-311
Rural Community Development: Policies and programmes-I

Credits :04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO311.1	Understand conceptual framework and theoretical approaches of Rural Community.
CO311.2	Understand changing pattern of rural leadership in Indian context
CO311.3	Understand functioning of traditional village organizations in imparting informal justice
CO311.4	Develop comprehensive understanding and competencies for social work intervention in rural areas

UNIT-I

- Rural Community: definition, features and Characteristics.
- Rural Sociology and its use in understanding of rural community.
- Major Institutions of Indian Rural Community: religion, caste, class, marriage and family.

Unit-II

- Rural Community Development: concept, nature, assumptions, history, philosophy and approaches: target group oriented, area based, integrated rural development.
- Extension Education : concept and methods
- Rural Development: concept, meaning, approach and issues related to rural development.
- Social Education: Concept, objective, historical background, methods of social education (audio-visual aids, reading material, adult literacy)
Communication and education as tools to empower rural poor.

UNIT-III

- Traditional village organizations; Panchayat, caste panchayat, Khap panchayat and informal justice system in rural communities.
- Community Power Structure: leadership in Indian villages: factors influencing leadership and changing patterns of leadership in Indian villages.
- Provision of loan and its related problems; return of loan, waiving off loan and its impact.

UNIT-IV

- Democratic Decentralization: concept and importance.
- Panchayati Raj in India: Balwant Rai Mehta Committee and Ashok Mehta Committee reports, 73rd Constitutional Amendment.
- Representation of people's Act.
- Rural employment, under -employment and unemployment.
- Government efforts to minimize and remove rural unemployment

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

Bibliography:

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17. Singla Komal 2010 : Rural Development in India (Retospect and Prospect), Concept, New Dehli
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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(E)-311
(Rural Community Development: Policies and programmes-I)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
311.1	3	3	3	3	2	3	3	3	3	3	3	3
311.2	3	3	3	3	3	3	3	3	3	3	3	3
311.3	3	3	3	3	2	2	3	3	3	3	3	2
311.4	3	3	3	2	3	3	2	3	3	3	3	3
Average	3	3	3	2.75	2.50	2.75	2.75	3	3	3	3	2.75

**Table 3: CO-PSO matrix for the course MSW(E)-311
(Rural Community Development: Policies and programmes-I)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
311.1	3	3	3	3	3
311.2	3	3	3	3	3
311.3	2	3	3	2	2
311.4	3	2	2	3	3
Average	2.75	2.75	2.75	2.75	2.75

Group-IV
Paper Code –MSW(E)-312
Urban Community Development: Policies and Programmes-I

Credits :04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO312.1	Understand concept of urban community and impact of urbanization on social institutions.
CO312.2	Critically analyse the urban community developmental programmes to eliminate poverty
CO312.3	Understand the role of banks, industries and voluntary organization in Urban Community Development
CO312.4	Develop comprehensive understanding and competencies for social work intervention in urban areas

UNIT-I

- Urban Community: Concept and characteristics.
- Growth of cities: Causes and consequences, different related concepts such as metropolis, towns, megapolis.
- Urbanization: Concept, causes, process and significance for human development.
- Urbanization and migration: Causes, consequences and checks on migration.

UNIT-II

- Urbanization in India: Demographic and occupational aspects, economic pattern.
- Urbanization and social institutions such as marriage, family, education, religion and recreation.
- Urbanization and economic development, urbanization and problems of social defense.
- Social implications of urbanization: Emergence of urban slums; causes, growth and problems, life and living in slum, slum city relationship, different programmes related to slum.

UNIT-III

- Urban Community Development (UCD): Need, concept, historical development, assumptions, philosophy, objectives, functional areas, methods and programmes of urban community development, barriers of urban community development.
- Public support in urban community development: Role of banks, industries and voluntary organizations in urban community development

UNIT-IV

- Urban poverty: Nature and extent.
- Factors and implications of urban poverty.
- Developmental programmes for urban poor.
- Review of urban planning in India.
- Scope of social work intervention in urban development.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(E)-312
(Urban Community Development: Policies and Programmes-I)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
312.1	3	3	3	3	2	2	3	3	2	2	3	-
312.2	3	3	3	3	3	3	3	3	2	-	3	3
312.3	3	3	3	3	3	3	3	2	3	3	3	3
312.4	3	3	3	3	2	2	3	2	2	3	2	2
Average	3	3	3	3	2.50	2.50	3	2.50	2.25	2	2.75	2

**Table 3: CO-PSO matrix for the course MSW(E)-312
(Urban Community Development: Policies and Programmes-I)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
312.1	3	3	3	3	3
312.2	3	2	2	3	3
312.3	2	3	3	3	2
312.4	3	2	3	2	3
Average	2.75	2.50	2.75	2.75	2.75

Group-V
Paper Code –MSW(E)-313
Crime and Criminal Justice-I

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO313.1	Conceptualize criminology and its approaches and relationship with other social sciences.
CO313.2	Critically analyse the various theories of crime
CO313.3	Gain knowledge about national and international perspectives of criminal justice system
CO313.4	Understand the relevance of criminology and the practice of social work in contemporary society

UNIT-I

- Criminology: definition, nature and scope
- Social, psychological and legal approaches of criminology
- Relationship of criminology with other social sciences
- Relevance of criminology to contemporary society

UNIT-II

- Crime: definition and nature, forms and consequences
- Theories of Crime : Sociological theories, Ecological theory.
- Culture Conflict theory
- Differential Association theory.
- Anomie theory

UNIT-III

- Positive Theories of Crime:
- Morphological theories.
- Biological theories: Constitution, Genetics, Chromosomes.
- Psychological Theories of crime:
- Learning Behavior theory
- Psycho-analytical theory.
- Conditional Adaptation Theory.

UNIT -IV

- Criminal Justice System : meaning, purpose and social relevance
- Historical evolution of criminal justice system
- Overview of CJS: national and international perspective.
- Co ordination in criminal justice system.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.

- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(E)-313
(Crime and criminal Justice-I)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
313.1	3	3	3	3	2	3	3	3	3	2	3	3
313.2	2	3	3	3	3	3	3	3	3	3	3	3
313.3	3	3	3	3	2	3	3	3	3	3	3	2
313.4	3	3	3	3	3	3	3	3	3	3	3	2
Average	2.75	3	3	3	2.50	3	3	3	3	2.75	2.75	2.50

Table 3: CO-PSO matrix for the course MSW(E)-313
(Crime and criminal Justice-I)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
313.1	3	3	3	3	3
313.2	3	3	2	3	2
313.3	3	3	3	2	3
313.4	3	3	3	3	2
Average	3	3	2.75	2.75	2.50

Group-V
Paper Code –MSW(E)-314

Institutional Services and Rehabilitation of Criminals-1

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO314.1	Know the theoretical and historical framework punishment and its various theories.
CO314.2	Understand the prison administrative system in India
CO314.3	Critically analyse the various institutional and non institutional services for offenders
CO314.4	Practice social work knowledge in institutional and non-institutional settings

UNIT- I

- Nature, meaning and importance of punishment
- Forms of punishment in ancient, medieval and modern times.
- Theories of punishment
- New alternative forms of punishment.

UNIT-II

- Definition and need of prison
- Prisons in ancient, medieval and modern times
- Types of prisoners.
- Prison reforms:- Role of inquiry committees and commissions.
- Prison administration.

UNIT-III

- History and evolution of prison legislations in India
- Prisons Act.
- Prisoners Act: Transfer of Prisoners Act
- Jail Manuals
- UN Standard Minimum Rules for treatment of prisoners and other standard settings, conventions and documents.

UNIT- IV

- Meaning, purpose and types of institutional and non institutional Services for offenders
- Correctional programs,
- Probation & Parole, meaning, scope and legal provisions under Probation of Offenders Act and other laws
- After care and Rehabilitation services.
- Role of NGOs

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).

- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

Bibliography:

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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(E)-314
(Institutional Services and Rehabilitation of Criminals-I)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
314.1	3	3	3	3	2	3	3	3	3	3	3	3
314.2	3	3	3	3	3	3	3	2	2	2	3	3
314.3	3	3	3	3	2	3	3	3	3	3	3	3
314.4	3	3	2	3	3	3	3	3	3	3	3	3
Average	3	3	2.75	3	2.50	3	3	2.75	2.75	2.75	3	3

Table 3: CO-PSO matrix for the course MSW(E)-314
(Institutional Services and Rehabilitation of Criminals-I)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
314.1	3	3	3	3	3
314.2	3	2	2	3	2
314.3	3	3	3	3	2
314.4	3	3	3	3	3
Average	3	2.75	2.75	3	2.50

Paper Code -MSW(C)-315
Field Work Practicum

Credits : 08
Max. Marks. : 200
External Viva-Voce: 150
Internal Assessment: 50

Course Outcome:-

At the end of the course, the students will be able to:-

CO315.1	Develop knowledge about complexity/pathological patterns of behaviour among individuals, families, groups and communities.
CO315.2	Enhance functioning of the change agent system to initiate new services and participate in the planning and policy making process of the organization where the students are placed for field-work
CO315.3	Develop skills to critically analyze and evaluate problems/needs of individuals, families, groups and communities in the context of the micro and macro systems
CO315.4	Use leadership in the interdisciplinary team and adequately interpret the social worker's role

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-315
(Field Work Practicum)

CO#	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
315.1	3	3	3	3	3	3	3	3	3	3	3	3
315.2	3	3	3	3	3	3	3	3	3	3	3	3
315.3	3	3	3	3	3	2	3	3	3	3	3	3
315.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	2.75	3	3	3	3	3	3

Table 3: CO-PSO matrix for the course MSW(C)-315
(Field Work Practicum)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
315.1	3	3	3	3	3
315.2	3	3	3	3	3
315.3	3	3	3	3	3
315.4	3	3	3	3	3
Average	3	3	3	3	3

Table 4: CO-PO-PSO mapping matrix for all the courses of Master of Social Work- 3rd Semester

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
MSW(C)-301	3	2.75	3	2.75	2.25	2.75	3	2.75	3	2.75	3	2.5	3	3	3	3	3
MSW(C)-302	3	3	3	2.75	2.75	2.75	3	2.75	3	2.75	3	2.75	3	3	2.75	3	3
MSW(C)-303	3	3	3	3	3	2.75	3	2.75	3	2.75	3	3	3	3	3	3	3
MSW(C)-304	3	3	3	3	2.75	3	3	3	3	2.75	3	2.75	3	2.75	3	3	3
MSW(E)-305	3	2.75	3	3	3	3	3	3	3	3	3	3	3	3	3	2.75	3
MSW(E)-306	3	2.75	3	2.75	2.5	3	2.75	3	3	2.5	3	2.75	3	3	3	2.75	3
MSW(E)-307	3	2.75	3	3	2.75	3	3	3	3	2.75	3	2.75	3	3	3	2.75	2.75
MSW(E)-308	3	3	2.75	2.75	2.75	3	3	3	3	2.75	3	3	3	3	2.75	3	3
MSW(E)-309	3	3	3	2.75	2.75	3	3	3	3	3	3	3	3	3	3	3	3
MSW(E)-310	3	3	3	2.75	2.75	3	2.75	3	3	2.75	3	3	3	3	2.75	3	3
MSW(E)-311	3	3	3	2.75	2.50	2.75	2.75	3	3	3	3	2.75	2.75	2.75	2.75	2.75	2.75
MSW(E)-312	3	3	3	3	2.50	2.50	3	2.50	2.25	2	2.75	2	2.75	2.50	2.75	2.75	2.75
MSW(E)-313	2.75	3	3	3	2.50	3	3	3	3	2.75	2.75	2.50	3	3	2.75	2.75	2.50
MSW(E)-314	3	3	2.75	3	2.50	3	3	2.75	2.75	2.75	3	3	3	2.75	2.75	3	2.50
MSW(C)-315	3	3	3	3	3	2.75	3	3	3	3	3	3	3	3	3	3	3

Semester-IV

Paper Code- MSW(C)-401

Dynamics of Social Development in View of Globalization

Credits : 04

Max Marks. 100

Theory : 80

Internal Assessment : 20

Time: 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO401.1	Understand critically the concept, content and process of social development.
CO401.2	Develop the capacity of identify linkages among social needs, problems, development issues and policies
CO401.3	Develop skills to promote social, economic and political justice
CO401.4	Develop appreciation of the relevance of social policy and social development to social work practice

UNIT-I

- Social Development: meaning, concept, indicators, goals, assumptions and factors of Social Development.
- Basic needs in Social Development and Components of social development.
- Human Development Index, Millennium Development Goals (MDGs)
- Problems of social development.

UNIT-II

- Social and economic transformation in India after independence.
- Models of social development: Gandhian, Nehruvian and General model, Institutionalization model, Push model, input, model, Gandhian and Nehruvian model
- Relationship between Social work and Social development: role and intervention.

UNIT-III

- Economic development: meaning and indicators.
- Characteristics of developed and developing countries.
- Economic system: Theories of distribution; Ricardo and Marx.
- Theories of economic development- Rostow's stages of economic growth and balanced growth theory.
- National Income concepts: Gross National Product (GNP), Gross Domestic Product (GDP), Net National Product (NNP), Per Capita Income (PCI), Personal Income (PI), Domestic Income (DI) .

UNIT-IV

- Globalization and its impact on quality of life.
- Poverty in India: concept of absolute, subjective and relative poverty.

- Causes of poverty, Current poverty alleviation programmes in India.
- Social Inequalities: nature, causes and extent.
- Social exclusion and inclusive Development Policy, planning and administration concerning development of rural area.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-401
(Dynamics of Social Development in View of Globalization)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
401.1	03	03	03	02	-	02	03	03	03	-	03	-
401.2	03	03	03	03	-	03	03	03	03	-	03	-
401.3	02	03	03	02	-	02	02	03	02	-	03	-
401.4	03	02	03	03	-	03	03	03	02	-	03	-
Average	2.75	2.75	03	2.5	-	2.5	2.75	03	2.5	-	03	-

Table 3: CO-PSO matrix for the course MSW(C)-401
(Dynamics of Social Development in View of Globalization)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
401.1	03	03	02	02	03
401.2	03	03	03	03	03
401.3	03	03	02	03	03
401.4	03	03	03	03	03
Average	03	03	2.5	2.75	03

Paper Code -MSW(C)-402
Population, Environment and Disaster Management

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO402.1	Understand Conceptual frame work of population, environment and disaster management.
CO402.2	Understand the impact of population dynamics, environmental degradation and disaster on the lives of people
CO402.3	Understand theoretical perspective on environmental sustainability and disaster management
CO402.4	Develop the skill to promote and Implement theoretical knowledge through Social Work Intervention

UNIT-I

- Population: Characteristics of Indian Population, Determinants and Consequences
- Population Dynamics: Global Concerns, World Action Plan, Initiatives of Government and Non- Governmental Organizations
- Population Education: Need, Aims, Scope and Dimensions of Population Education
Social Work intervention in Population Education

UNIT-II

- Environment: meaning, nature and components.
- Environmental imbalance: global warming and green house effect, ozone Layer depletion and its effects.
- Environment Pollution: types, causes, effects.
- The Environment Protection Act, 1986.
- Role of government, NGOs and community in environmental protection.

UNIT-III

- Disaster: concept, meaning, definition and types (natural and manmade)
- Factors contributing to disasters: Political, economic, social, technological, cultural, geographical etc.
- Impact of disasters: Physical, economic, spatial, psycho-social etc.

UNIT-IV

- Disaster management: concept, meaning and definition.
- Pre-disaster prevention and mitigation of disasters.
- Protection against post disaster effects and Rehabilitation.
- National Disaster Management Authority: organization and functions
- Role of Govt. and NGOs in disaster management.
- Social Work intervention at different levels.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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Table 1: Scale of mapping between COs and POs/PSOs

Scale	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(C)-402
(Population, Environment and Disaster Management)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
402.1	03	02	03	03	-	02	03	02	03	-	03	-
402.2	03	02	03	03	-	03	03	03	03	-	03	-
402.3	03	03	03	03	-	02	03	03	03	-	03	-
402.4	02	03	03	03	-	03	03	03	03	-	03	-
Average	2.75	2.5	03	03	-	2.5	03	2.75	03	-	03	-

**Table 3: CO-PSO matrix for the course MSW(C)-402
(Population, Environment and Disaster Management)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
402.1	03	03	02	02	03
402.2	03	03	02	03	03
402.3	03	03	03	03	03
402.4	03	03	03	03	03
Average	03	03	2.5	2.75	03

Paper Code -MSW(C)-403
Social Work Research and Statistics-II

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hour

Course Outcome:-

At the end of the course, the students will be able to:-

CO403.1	Develop competence in conceptualizing, designing and implementing research using quantitative and qualitative paradigms and techniques.
CO403.2	Have the requisite skills to analyze, interpret and present both quantitative and qualitative data and use of basic statistics in social work research
CO403.3	Understand the use of basic statistics in social work research
CO403.4	Familiarize students with collection of data, analysis and research report writing

UNIT-I

- Social Work Research – meaning, purpose and process
- Scope and importance of Social Work Research
- Qualitative and Participatory Research – meaning, characteristics and use of these methods in inquiry
- Research Design – meaning and types

UNIT-II

- Measures of Central Tendency: meaning, uses, and computation of mean, median and mode.
- Measures of Dispersion: meaning, assumptions, uses and computation of range, quartile deviation, standard deviation and average deviation
- Correlation-meaning, assumption, uses, computation and interpretation of product moment and rank difference correlation

UNIT-III

- Normal Probability Curve- an overview
- Simple Regression: Regression Equation of Y on X and X on Y.
- Chi Square Test- meaning, assumption, uses and computation by hypothesis of equality and independence
- Significance of difference between (i) Means (2) Proportion.

UNIT-IV

- Research Report – purpose, characteristics and steps of writing report
- References and Bibliography
- Computer for Data Processing, Basics of MS Word and MS Excel.
- Basics of SPSS and its use in Social Work Research.
- Data management, analysis and presentation.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
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<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(C)-403
(Social Work Research and Statistics-II)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
403.1	03	03	03	03	03	02	02	03	03	-	03	03
403.2	02	03	02	03	03	03	02	03	03	-	03	03
403.3	03	03	02	03	03	03	02	03	03	-	03	03
403.4	03	03	02	03	03	02	02	03	02	-	03	02
Average	2.75	03	2.25	03	03	2.5	02	03	2.75	-	03	2.75

**Table 3: CO-PSO matrix for the course MSW(C)-403
(Social Work Research and Statistics-II)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
403.1	03	02	03	03	02
403.2	03	03	03	03	02
403.3	03	03	03	02	02
403.4	03	03	03	03	02
Average	03	2.75	03	2.75	02

Paper Code -MSW(C)-404
Emerging Areas of Social Work Practice

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO404.1	Understand conceptual framework and theoretical approaches of aged, disabled and livelihood.
CO404.2	Understand social work practice with aged, disabled and on gender issues
CO404.3	Gain critically understanding of various policies and progresses related to aged, disabled, women and children
CO404.4	Develop the skill to promote and Implement theoretical knowledge through Social Work Intervention

UNIT-I

- The aged: concept and definition-legal, social, cultural and medical views.
- Perception of the role of aged in India Needs and problems of the aged.
- Gerontology meaning, definition and Perceptive in Indian context.
- Role of family and Social work intervention with the aged.
- The maintenance and welfare of Parents and Senior Citizens Act-2007.

UNIT-II

- Concept of impairment, disability and handicap.
- Types of disability: Sensory, physical and mental illness.
- Social handicap: concept and nature.
- Needs and problems of the disabled at different life stages.
- Community Based Rehabilitation.
- Family's reactions towards disability in their children and its role in their care and Protection
- Social and Legislature efforts for the rehabilitation of disabled persons.

UNIT-III

- Livelihood: Meaning, Definition, Indicators and Strategies
- A Framework for livelihood analysis, Income and Consumption Patterns of Rural People in India, Sustainable Livelihood Principles
- Livelihood in Developing Countries: Diversity and Diversification
- Major Livelihood Programmes in India, Challenges in Livelihood Promotion

UNIT-IV

- Demographic features of women and Children in India
- Gender: concept, issues, biases and implications.
- Violence Against women and Children- Legal Safeguards
- Gender mainstreaming in Social Work, Gender Budgeting

- Programmes for women and Children
- Social Work Intervention

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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Table 1: Scale of mapping between COs and POs/PSOs

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<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(C)-404
(Emerging Areas of Social Work Practice)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
404.1	03	03	03	02	-	03	03	03	03	-	02	-
404.2	03	02	03	02	-	03	03	03	03	-	02	-
404.3	03	03	03	03	-	03	03	03	03	-	03	-
404.4	03	03	03	02	-	03	03	03	03	-	03	-
Average	03	2.75	03	2.25	-	03	03	03	03	-	2.5	-

**Table 3: CO-PSO matrix for the course MSW(C)-404
(Emerging Areas of Social Work Practice)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
404.1	03	03	02	03	03
404.2	03	03	02	03	03
404.3	03	03	03	03	03
404.4	02	03	03	03	02
Average	2.75	03	2.5	03	2.75

Group-I
Paper Code –MSW(E)-405
Human Resource Management and Industrial Relations -II

Credits : 04
Max. Marks. : 100
Theory : 80
Internal Assessment: 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO405.1	Understand working and functioning of International Labour Organization and trade unions in industrial settings.
CO405.2	Understand critically the Industrial democracy, Collective Bargaining: Worker's Participation in Management
CO405.3	Understand the critical issues of Organisational Behaviour in contemporary Indian industrial scenario
CO405.4	Develop skills necessary to engage in the students in industries to practice social work

UNIT – I

- International Labour Organization (ILO): Organizational set up, functions and role of International Labour Organization (ILO) in Industrial Relations in India.
- Trade Union: meaning, types, theories and historical development of Trade Union Movement in India.
- Weaknesses of Trade Unions and essentials for successful trade union.
- Role of trade unions in industrial relation.

UNIT – II

- Industrial democracy: meaning, definition, features, objectives, significance and pre-requisites industrial democracy.
- Collective Bargaining: meaning, objective and process, collective bargaining in India
- Worker's Participation in Management: meaning, objectives, forms and pre-requisite conditions for effective working of the scheme.
- Evaluation of the Indian Schemes of worker's participation in management.

UNIT – III

- Concept of organization, theories of organization: classical theories, bureaucratic theory and contingency theory. Organisational Behaviour: meaning, nature, scope and historical background.
- Contribution of Elton Mayo, Renis and Likert.

UNIT – IV

- Meaning and definition of stress, factors and sources of stress at workplace. Impact of stress on performance and satisfaction.
- Motivation: meaning, importance and a brief explanation of theories of motivation Maslow's Need of Hierarchy theory, McGregor's participation theory, Argyris's theory and Vroom's Expectancy theory.
- Corporate Social responsibility; issues and prospect in contemporary Indian industrial scenario.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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|----|--|--|
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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
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<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(E)-405
(Human Resource Management and Industrial Relations –II)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
405.1	03	02	03	02	-	03	03	03	02	02	03	-
405.2	03	03	03	02	-	03	03	03	02	02	02	-
405.3	03	03	03	02	-	03	03	03	03	02	02	-
405.4	02	03	03	02	-	03	03	03	03	03	03	-
Average	2.75	2.75	03	02	-	03	03	03	2.5	2.25	2.5	-

Table 3: CO-PSO matrix for the course MSW(E)-405
(Human Resource Management and Industrial Relations –II)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
405.1	03	02	02	03	02
405.2	03	02	02	03	02
405.3	03	02	03	03	02
405.4	03	02	03	03	02
Average	03	02	2.5	03	02

Group-I
Paper Code –MSW(E)-406
Labour Welfare and Labour Legislations-II

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO406.1	Understand conceptual and theoretical framework of labour legislations and wages in industries.
CO406.2	Understand and analyse industrial relations in reference to grievances, misconduct, and maintaining discipline in Industries
CO406.3	Analyse and critically appraise labour legislations in organized and unorganized sectors
CO406.4	Develop skills to Practice Social Work Knowledge in Industries

UNIT: I

- Labour legislation: meaning, need, scope and principles
- Grievance: meaning, definition, causes/sources
- Legislative aspects of a grievance procedure and need for grievance procedure/machinery in industries.
- Industrial Discipline: meaning, approaches & code of discipline

UNIT: II

- Wages for industrial workers: - meaning, importance, theories of wages
- Types of wages: minimum, fare and living wages
- Methods of wage determination in India: Wage Boards, adjudication and bipartite committees
- Wage Incentives and Fringe Benefits
- National Wage Policy

UNIT: III

- The Payment of Wages Act, 1936
- The Minimum Wages Act, 1948
- The Payment of Bonus Act, 1965.
- The Equal Remuneration Act, 1976

UNIT: IV

- The Payment of Gratuity Act, 1972
- The Maternity Benefit Act, 1961
- Child Labour (Prohibition and Regulation) Act, 1986
- The Unorganised Worker's Social Security Act, 2008

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

Bibliography:

1. Bhogoliwal, TN 1982 : Economics of Labour and Industrial Relations, Agra: Sahitaya Bhawan
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10. The Unorganised Workers Social Security Act, 2008.

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(E)-406
(Labour Welfare and Labour Legislations-II)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
406.1	03	02	03	02	-	03	03	03	03	02	03	-
406.2	03	03	03	02	-	03	03	03	03	02	03	-
406.3	03	02	03	02	-	03	03	03	03	03	03	-
406.4	03	03	03	02	-	03	02	03	03	03	03	-
Average	03	2.5	03	02	-	03	2.75	03	03	2.5	03	-

**Table 3: CO-PSO matrix for the course MSW(E)-406
(Labour Welfare and Labour Legislations-II)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
406.1	03	03	03	03	02
406.2	02	02	03	03	03
406.3	03	03	02	03	02
406.4	03	03	03	03	02
Average	2.75	2.75	2.75	03	2.25

Group-II
Paper Code –MSW(E)-407
Family Dynamics: Issues & Needs-II

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO407.1	Understand the marriage as a social Institution.
CO407.2	Examine state of children in India, their vulnerabilities and efficacy of policies and programmes for the children
CO407.3	Sharpen the skills, techniques and knowledge required for working with the youth and children
CO407.4	Understand multifaceted needs, issues and problems of youth

UNIT-I

- Marriage: nature and types, Changing Marriage Patterns.
- Incidence of Divorce in India.
- Marriage Counseling and Guidance- nature and process
- Role of social worker in marriage counseling.

UNIT-II

- Child Abuse, Child labour and Child marriage: its causes and consequences ; Social and Legislature efforts to control it
- Family Courts Act, 1985.
- Legislations related to Dowry, Domestic Violence, Adoption of Children, Harassment at Work Place
- Rights of Inheritance and Succession
- National Policy for Women Empowerment.

UNIT-III

- Demographic profile of Youth in India
- Concept of Youth welfare.
- Student and Non student youth, Services for student and non student Youth
- Youth Welfare Programmes in India; National youth policy.

UNIT-IV

- Needs and problems of Youth in the area of family adjustment, education, marriage and employment.
- Intergenerational conflict, youth unrest and politicization of youth
- Role of youth in development.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

Bibliography

1. Brien Shirley, O. : Child Abuse, Uni. Press, .USA.
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2. Dabir , Neela 2000 : Women in Distress, Rawat
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19. Zimmerman S.L 1992. : Family Policies and Families well being, New Delhi, sage Publication.

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(E)-407

(Family Dynamics: Issues & Needs-II)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
407.1	03	03	03	02	-	03	03	02	03	01	02	-
407.2	03	03	03	03	-	03	02	03	03	02	03	-
407.3	02	03	03	03	-	03	02	03	03	03	03	-
407.4	03	03	03	02	-	03	02	03	03	03	02	-
Average	2.75	03	03	2.5	-	03	2.25	2.75	03	2.25	2.5	-

Table 3: CO-PSO matrix for the course MSW(E)-407

(Family Dynamics: Issues & Needs-II)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
407.1	03	03	02	02	03
407.2	03	03	02	03	03
407.3	03	02	03	03	02
407.4	03	03	02	03	03
Average	03	2.75	2.25	2.75	2.75

Group-II
Paper Code –MSW(E)-408
Developmental Services for Women and Children - II

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO408.1	Understand child rights, global policies and trends in the field of child welfare.
CO408.2	Understand the problem of women and children in difficult circumstances and social & legal efforts to curb the problem
CO408.3	Understand the issues and challenges related to women in the present scenario
CO408.4	Develop critical ability to analyse and use of the theoretical knowledge to bring desired changes in the situation of women and children

UNIT- I

- Rights of Children – Constitutional and Legislative
- National and Global policies and trends in Child Welfare – A critical review.
- Role of Social Worker in promotion of Child Welfare Services.
- Family Welfare and its implications for Social Work practice.

UNIT-II

- Policies and Programmes for Destitute, Neglected, Handicapped and Mentally Retarded Children.
- Role of Professional Social Worker in correctional institutions for Disabled Children.
- Functions of National and International agencies working for Child Welfare.
- Reproductive Child Health – concept, objectives and its programmes.

UNIT-III

- Gender Issues, Gender Budgeting and areas of Gender Discrimination
- Institutional and Non-Institutional Programmes and Services for the both mother and child.
- Violence against Women – Infanticide, Rape, Dowry death, Sexual abuse, Women Labour.
- Female Sex Workers – concept, problems and social work intervention with female sex workers.

UNIT-IV

- Mother and Child Health Care – concept, Pre-natal, Neo-natal and Post-natal.
- Rehabilitative Services for Women – Widows, Deserted/ Divorced.
- Protective Services and Programmes for Women under Five Year Plans.
- Economic Empowerment of Women through-Micro-financing, Self-Help Groups, Capacity building and Skill Development Training.

Note.

- The examiner will set 9 questions in all.

- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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1. Aggarwal, Beena : A Field of one's own : Gender and Land Rights in South Asia, Delhi : Cambridge University Press.
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- 16 Verma, R.B.S., Verma, H.S., Singh Raj kanwer. 2006 Empowerment of Weaker Sectors in India, Serials Publications, New Delhi
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Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(E)-408
(Developmental Services for Women and Children – II)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
408.1	03	03	03	03	-	03	03	03	03	02	03	-
408.2	03	03	03	03	-	03	03	03	03	02	03	-
408.3	03	03	03	03	-	03	03	03	03	03	03	-
408.4	03	03	03	03	-	03	03	03	03	03	03	-
Average	03	03	03	03	-	03	03	03	03	2.5	03	-

**Table 3: CO-PSO matrix for the course MSW(E)-408
(Developmental Services for Women and Children – II)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
408.1	03	03	03	03	03
408.2	03	03	03	03	03
408.3	03	03	03	03	03
408.4	03	03	03	03	03
Average	03	03	03	03	03

Group-III

Paper Code –MSW(E)-409 Policy and Development of Health Care-II

Credits	:04
Max Marks.	100
Theory	: 80
Internal Assessment	: 20
Time:	3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO409.1	Develop a critical perspective of health care services and programmes in the context of health scenario in India.
CO409.2	Know the administrative structure of health services in India
CO409.3	Understand the Psycho-social aspects of various medical condition
CO409.4	Develop a holistic and integrated approach to social work practice in the field of health

UNIT-I

- Emotional aspects of illness.
- Concept of patient and his role.
- Health Care Services in India: structure and functions, primary health care; concept, issues availability and problems. National Health Mission (NHM 2013). Role of NGOs in providing health services.
- Polyclinic, nursing homes, quacks and rural health services
- Different systems of medicine and their role: Ayurveda, Homeopathy, Unani and Allopathy.

UNIT-II

- Medical conditions requiring intervention cancer, ulcers, Burns, Poisoning snake bite.
- Cancer: types, causes and treatment. Role of social worker in the prevention of cancer
- Migrain – symptoms, causes and treatment.
- Thyroid – types, causes and treatment.

UNIT-III

- Policy for specialized groups and diseases.
- Indian and western treatment and approaches to various psychiatric problems.
- Field instructions supervision, recording, documentation and evaluation in psychiatric social worker practice.

UNIT-IV

- Community Health and its progress: People's participation, school health services, health insurance systems.
- Role of Social Worker in policy development for health.
- Preparing family and community for the return of the affected individual.
- Follow up, Public health and its programmes.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

Bibliography:

1. Allen, K.M. & Spitzer, W.J., 2015 Social Work Practice in Health care Advanced Approaches and Emerging Trends, Sage Publications
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23. Simith, Bryan, C.,1978 Community Health : An Epidemiological Approach: New York : Macmillan Pub. Co.
24. UNICEF Health and Basic Services : Keys to Development New Delhi.
25. Wainwright, David. 2008. A Sociology of Health, Sage Publication, New Delhi.

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
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<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(E)-409
(Policy and Development of Health Care-II)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
409.1	3	3	3	3	3	3	3	3	3	2	3	3
409.2	3	3	3	3	2	3	3	3	2	3	3	3
409.3	3	3	3	3	3	3	3	3	3	3	3	2
409.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	2.75	3	3	3	2.75	2.75	3	2.75

Table 3: CO-PSO matrix for the course MSW(E)-409
(Policy and Development of Health Care-II)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
409.1	3	3	3	3	3
409.2	3	2	3	3	2
409.3	3	3	3	3	3
409.4	3	3	3	3	3
Average	3	2.75	3	3	2.75

Group-III
Paper Code –MSW(E)-410
Psycho-Social Perspectives of Mental Health-II

Credits :04
Max Marks. 100
Theory : 80
Internal Assessment : 20
Time: 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO410.1	Understand the theoretical framework of psychiatric social work practice.
CO410.2	Understand and analyze mental health problems, policies and services in Indian Context
CO410.3	Develop non-judgmental attitudes to those experiencing problems of mental health
CO410.4	Develop the capacity to apply knowledge and skills of the social work profession in domain of mental health

UNIT-I

- Concept of Psychiatry and Psychopathology.
- History of mental health care in India and in western countries.
- The field of Psychiatric social work: basic concept, historical development, value concepts understanding psychiatric social work practice.

UNIT-II

- Meaning of Sociology of mental illness
- Socio genesis of mental disorders: coping pattern in different cultures socialization and mental health: Value conflict
- Hospital as a social organization
- Child & Adolescent psychiatric disorders: Autism, ADHD, Temper tantrums Eating disorder, Sleep Disorder.

UNIT-III

- Rogi Kalyan Samiti and its role.
- Development of mental health profession and man-power, private practice, problems and limitations of treatment.
- Property rights of certified mental patient, insanity as defense.
- Community consciousness of mental health.

UNIT-IV

- Mental Health Act, 1987, Mental Health Care Act, 2017, The National Trust Act,1999
- Recent trends in mental health services: mental hospitals, psychiatric clinics, nursing homes, psychiatric emergency, team approach
- Community Mental Health and units in general hospital.
- Industrial mental health services

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

Bibliography:

1. Bartkatt Harriet, M.,1961 Social Work Practice in the Health Field, New York : National Association, of Social Workers.
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15. World Health Organization 1992. The ICD-10 Classification of Mental and Behavioural Disorders. Clinical descriptions and diagnostic guidelines, Oxford University Press, Delhi.
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<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

**Table 2: CO-PO matrix for the course MSW(E)-410
(Psycho-Social Perspectives of Mental Health-II)**

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
410.1	3	3	3	3	2	3	3	3	3	2	3	3
410.2	3	3	3	3	3	3	3	3	3	3	3	3
410.3	3	3	3	3	3	2	3	3	3	3	3	3
410.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	2.75	2.75	3	3	3	2.75	3	3

**Table 3: CO-PSO matrix for the course MSW(E)-410
(Psycho-Social Perspectives of Mental Health-II)**

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
410.1	3	3	3	3	3
410.2	3	3	3	3	3
410.3	3	3	3	3	3
410.4	3	3	3	3	3
Average	3	3	3	3	3

Group-IV
Paper Code –MSW(E)-411
Rural Community Development: Policies and Programmes-II

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO411.1	Understand basic concepts and theoretical approaches related to indian Rural Economy.
CO411.2	Critically analysis and evaluate of the programmes/services aiming to bring desired change in Indian Society
CO411.3	Understand the role of the various agencies working in the area of rural development
CO411.4	Develop capacity to apply social work knowledge and skills in rural community development

UNIT-I

- Rural economy: definition, scope and pattern.
- Economics of agriculture.
- Problems related to agriculture- technical, irrigation, manure, fertilizer, land and live stock.
- Land reforms in India.
- Surplus Land: its distribution and use.

Unit-II

- Livelihood: concept , meaning ,issues and food security
- Rural Labour: nature and problems; Agriculture labour; Main and marginal workers.
- Landless labour, bonded labour, removal of bonded labour, women labour, child labour.
- Government schemes/programmes for welfare of rural poor.
- Critical analysis of implementation of MNREGA

Unit-III

- Rural Development: organizational set up at central and state Levels, National Rural Employment Guarantee Act 2005.
- District Rural Development Agency (DRDA); organization function and challenges.
- UNESCO: structure and programmes for rural people.
- Concentization and social education for women, youth and role of social worker as Development promoter.

Unit-IV

- Rural and Cottage Industries: present scenario and challenges before it,
- Khadi and Village Industry Commission (KVIC).
- Role of voluntary organisations in rural development.
- Cooperation: philosophy, values and principles.
- Cooperative Organizations: nature, functions and their role in rural development
- Role of financial institutions such as (RBI, NABARD) Commercial Banks.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

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- | | | |
|----|---|---|
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the Seminar on Role of Voluntary Agencies in Rural Dev.,
NIPCCD, New Delhi.
19. Volken, H. et. Al.1982: Learning from the Rural Poor; Shared Experiences of
the Mobile Orientation and Training Team, New Delhi, Indian
Social Institute.

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(E)-411
(Rural Community Development: Policies and programmes-II)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
411.1	03	02	03	03	-	03	02	03	03	02	03	-
411.2	03	03	03	02	-	03	03	03	03	02	03	-
411.3	03	02	03	02	-	03	03	03	03	03	03	-
411.4	03	03	03	03	-	03	03	03	03	03	03	-
Average	03	2.5	03	2.5	-	03	2.75	03	03	2.5	03	-

Table 3: CO-PSO matrix for the course MSW(E)-411
(Rural Community Development: Policies and programmes-II)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
411.1	03	03	03	03	03
411.2	03	03	03	03	03
411.3	02	03	02	03	02
411.4	03	03	03	03	02
Average	2.75	03	2.75	03	2.5

Group-IV
Paper Code –MSW(E)-412
Urban Community Development: Policies and Programmes-II

Credits :04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO412.1	Understand Conceptual framework of urban economy and issues.
CO412.2	Understand the structure and functions of decentralized governance in urban areas
CO412.3	Critically analyse the policies and programme for urban community development
CO412.4	Develop capacity to apply social work knowledge and skills in domain of urban community development

Unit-I

- Urban Economy: Unorganized sector of urban economy, tertiarization, poverty and housing environment.
- National and international perspectives on unauthorized settlement.
- Structure, functions and achievements of Housing and Urban -Development Corporation (HUDCO), HDFC, National Housing Bank.
- Governmental urban housing schemes for poor sections.

Unit-II

- Urban Local Self-Government: Concept, structure and functions.
- Municipal Administration; historical development, responsibilities, pattern and procedure.
- Civic sense, civic right and civic responsibilities.
- Civic amenities and essential services.
- Structure, functions, powers and role in urban development of Municipal Corporation, Municipal Committee, Notified Town Area and Cantonment Board.

Unit-III

- Housing policies
- Housing problem in urban areas.
- Town Planning: Nature and approaches.
- National Capital Region (NCR): Prospects and problems
- Government efforts to solve housing problem.
- Perspective planning for urban development- management and evaluation of UCD projects

Unit-IV

- Public conveniences and facilities: Local public transportation, problems in transportation, Govt. efforts to manage problem of local transportation.

- Pollution in urban cities: Air and noise pollution, extent and control.
- Effect of pollution on physical and mental health.
- Public Distribution System and Consumer Protection Services.

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

Bibliography:

1. Centre for Urban Studies, IIPA, 1974. Urban Planning and Development Authorities, The Author, New Delhi.
2. Development support : Team, 1987. Community Development : An attempt by people's multi purpose Development society, Pune, Development Support Team.
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14. Verma,S.P. and Sharma,S.K. 1985 Comparative pub. Administration: Indian Institute of Public Administration, New Delhi.
15. Zaltman, G and Duncan, R. 1977 Strategies for Planned change, New york, Association Press

Table 1: Scale of mapping between Cos and Pos/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(E)-412
(Urban Community Development: Policies and Programmes-II)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
412.1	03	02	03	03	-	03	02	03	03	02	03	-
412.2	03	02	03	03	-	03	03	03	02	02	03	-
412.3	03	02	03	02	-	02	02	03	03	02	02	-
412.4	03	03	03	03	-	03	03	03	03	03	03	-
Average	03	2.25	03	2.75	-	2.75	2.5	03	2.75	2.25	2.75	-

Table 3: CO-PSO matrix for the course MSW(E)-412
(Urban Community Development: Policies and Programmes-II)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
412.1	03	03	03	03	03
412.2	02	02	02	03	02
412.3	02	03	02	03	03
412.4	03	03	03	03	02
Average	2.5	2.75	2.5	03	2.5

Group-V
Paper Code –MSW(E)-413
Crime and criminal Justice-II

Credits :04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO413.1	Understand criminal justice system in India
CO413.2	Critically analyse the components of judicial system
CO413.3	Examine critically legislations and strategies to prevent crime
CO413.4	Practice social work knowledge in the area of crime prevention

UNIT-I

- Need and importance of judicial system
- Components of judicial system: police, prosecution and courts
- Features of Indian judicial system: independence, public trial and fair trial

UNIT-II

- Criminal Justice system: process and prospective
- Social defense and legislation: An introduction to Indian Penal Code (IPC)
- Criminal Procedure Code (Cr. P.C)
- Anti beggary act
- Narcotics Drugs and Psychotropic Substances Act, 1985

UNIT- III

- Social change,
- Social deviance
- Social disorganization
- Individual disorganization,
- Group disorganization,
- Community disorganization
- Family disorganization

UNIT- IV

- Social control and crime prevention
- Community and crime prevention.
- Contemporary crime prevention strategies.
- Role of social worker in the prevention of crime

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.

- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered with in 100 words. Each question carry 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

Bibliography:

1. Akers, Ronald L. 2004. : Criminological Theories, Rawat Publications, Jaipur.
2. Canadino, Michael & Dignam, James, 2002. : The Penal System- An introduction, 3rd edition, Sage Publications.
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Table 1: Scale of mapping between COs and POs/PSOs

Scale	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(E)-413
(Crime and criminal Justice-II)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
413.1	3	3	2	2	-	2	3	2	2	-	2	-
413.2	3	3	3	2	-	2	3	3	3	-	2	-
413.3	3	3	3	3	-	3	3	3	3	-	3	-
413.4	3	3	3	3	-	3	3	3	3	-	3	-
Average	3	3	2.75	2.50	-	2.50	3	2.75	2.75	-	2.50	-

Table 3: CO-PSO matrix for the course MSW(E)-413
(Crime and criminal Justice-II)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
413.1	3	3	3	2	3
413.2	3	3	3	3	3
413.3	3	3	3	3	3
413.4	3	3	3	3	3
Average	3	3	3	2.75	3

Group-V
Paper Code –MSW(E)-414

Institutional Services and Rehabilitation of Criminals-II

Credits : 04
Max. Marks. 100
Theory : 80
Internal Assessment : 20
Time 3 Hours

Course Outcome:-

At the end of the course, the students will be able to:-

CO414.1	Conceptualize social justice in constitutional framework and social legislations
CO414.2	Critically analyse various social legislation meant for the protection of crime against human being
CO414.3	Understand about various forms of juvenile delinquency and patterns of delinquent behaviour in India
CO414.4	Develop capacity to apply social work knowledge and skills in the prevention and control of crime

UNIT-I

- Meaning and purpose of Social Legislation
- Historical account of social legislation in India.
- The concept of social justice and constitutional framework
- An assessment of social legislation in India.
- Impact of social legislation on the criminal law in India.

UNIT-II

- Protection of Civil Rights Act, 1976
- Dowry Prohibition Act, 1961
- Child Marriage and Restraint Act, 1929
- Child Labour Prohibition Act, 1986.

UNIT-III

- Bonded Labour Prohibition Act, 1976
- Prevention of Immoral Traffic Act, 1955
- Juvenile Justice (care and protection) Act, 2000
- The Protection of women against domestic violence Act 2005

UNIT -IV

- Definition; nature and forms of juvenile delinquency;
- Psychological and social explanations

- Delinquent Subculture
- Children in need of Care and Protection
- Patterns of delinquent behaviour in India.
- Changing concepts of juvenile delinquency from past to present

Note.

- The examiner will set 9 questions in all.
- Candidate will be required to attempt five questions.
- Question No. 1 will be compulsory, consisting of 5 short answer type questions covering all the units of the whole syllabus, to be answered within 100 words. Each question carries 4 marks (5X4=20 marks).
- Candidates are required to attempt other 4 long answer type questions, by selecting one from each of the four units. Each unit shall have two questions of 15 marks each. (4X15=60 Marks)

Bibliography:

1. Bhattacharya, Sunil K. 2000. Juvenile Justice – An Indian Scenario, Regency Publications, New Delhi.
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15. Child Labor Prohibition Act 1986.
16. Protection of Civil Rights Act,1976
17. Child Marriage and Restraint Act,1929
18. Child Labor Prohibition Act, 1986
19. Bonded Labor Prohibition Act, 1976
20. Juvenile Justice (care and protection) Act, 2000
21. The Protection of women against domestic violence Act 2005

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(E)-414
(Institutional Services and Rehabilitation of Criminals-II)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
414.1	3	2	3	3	-	2	3	3	3	-	2	-
414.2	3	2	3	3	-	2	3	3	3	-	2	-
414.3	3	2	3	3	-	2	3	3	3	-	2	-
414.4	3	3	3	3	-	3	3	3	3	-	3	-
Average	3	2.25	3	3	-	2.25	3	3	3	-	2.25	-

Table 3: CO-PSO matrix for the course MSW(E)-414
(Institutional Services and Rehabilitation of Criminals-II)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
414.1	3	3	2	2	3
414.2	3	3	3	3	3
414.3	3	3	3	3	3
414.4	3	3	3	3	3
Average	3	3	2.75	2.75	3

Paper Code -MSW(C)-415
Field Work Practicum

Credits : 08
Max. Marks. : 200
External Viva-Voce: 150
Internal Assessment: 50

Course Outcome:-

At the end of the course, the students will be able to:-

CO415.1	Work as a member of research team/initiate agency based small studies for assessment of problem/ need/delivery of services
CO415.2	Initiate projects/programmes in the agency and give leadership to others in implementation
CO415.3	The use of simple research procedures like data collection, classification, analysis and interpretation for maintenance of scientific data to assess problems/needs of the agency
CO415.4	Development of professional attitudes, conducive to work with individuals, families, groups and communities, leading gradually to an awareness of self as a professional person

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
<u>1</u>	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
<u>2</u>	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
<u>3</u>	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course MSW(C)-415
(Field Work Practicum)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
415.1	3	3	3	3	3	3	3	3	3	3	3	3
415.2	3	3	3	3	2	2	3	3	3	3	3	3
415.3	3	3	3	3	3	3	3	3	3	3	3	3
415.4	3	3	3	3	3	3	3	3	3	3	3	3
Average	3	3	3	3	2.75	2.75	3	3	3	3	3	3

Table 3: CO-PSO matrix for the course MSW(C)-415
(Field Work Practicum)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
415.1	3	3	3	3	3
415.2	3	3	3	3	3
415.3	3	3	3	3	3
415.4	3	3	3	3	3
Average	3	3	3	3	3

Table 4: CO-PO-PSO mapping matrix for all the courses of Master of Social Work- 4th Semester

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
MSW(C)-401	2.75	2.75	03	2.5	-	2.5	2.75	03	2.5	-	03	-	03	03	2.5	2.75	03
MSW(C)-402	2.75	2.5	03	03	-	2.5	03	2.75	03	-	03	-	03	03	2.5	2.75	03
MSW(C)-403	2.75	03	2.25	03	03	2.5	02	03	2.75	-	03	2.75	03	2.75	03	2.75	02
MSW(C)-404	03	2.75	03	2.25	-	03	03	03	03	-	2.5	-	2.75	03	2.5	03	2.75
MSW(E)-405	2.75	2.75	03	02	-	03	03	03	2.5	2.25	2.5	-	03	02	2.5	03	02
MSW(E)-406	03	2.5	03	02	-	03	2.75	03	03	2.5	03	-	2.75	2.75	2.75	03	2.25
MSW(E)-407	2.75	03	03	2.5	-	03	2.25	2.75	03	2.25	2.5	-	03	2.75	2.25	2.75	2.75
MSW(E)-408	03	03	03	03	-	03	03	03	03	2.5	03	-	03	03	03	03	03
MSW(E)-409	3	3	3	3	2.75	3	3	3	2.75	2.75	3	2.75	3	2.75	3	3	2.75
MSW(E)-410	3	3	3	3	2.75	2.75	3	3	3	2.75	3	3	3	3	3	3	3
MSW(E)-411	03	2.5	03	2.5	-	03	2.75	03	03	2.5	03	-	2.75	03	2.75	03	2.5
MSW(E)-412	03	2.25	03	2.75	-	2.75	2.5	03	2.75	2.25	2.75	-	2.5	2.75	2.5	03	2.5
MSW(E)-413	3	3	2.75	2.50	-	2.50	3	2.75	2.75	-	2.50	-	3	3	3	2.75	3
MSW(E)-414	3	2.25	3	3	-	2.25	3	3	3	-	2.25	-	3	3	2.75	2.75	3
MSW(C)-415	3	3	3	3	2.75	2.75	3	3	3	3	3	3	3	3	3	3	3

Department of Social Work, KUK

Open Elective Course for Non-Social Work Students

Name of the Papers:

Second semester

1. Basics of Social Work

Total credits: 2 credits

Total Marks: 50 marks

Third semester

2. Methods of Social Work

Total credits: 2 credits

Total Marks: 50 marks

Paper-I

Basics of Social Work

Max. Marks: 50
Total hours: 2hrs
Total credits: 2 Credits

Course Outcome:-

At the end of the course, the students will be able to:-

CO	Understand the conceptual framework of social work practice.
CO	Aware about the historical development of social work in Indian and worldwide perspective.
CO	Aware about reforms movements, programme and services for vulnerable groups
CO	Develop competence to analyze critically the contemporary social issues

Unit-I

- Social work: Meaning, nature and its scope,
- Relationship of Social Work with other Social Sciences.
- Goals of Social Work.
- Methods of social work.

Unit-II

- A brief discussion of historical development of Social Work in U.K, U.S.A and India.
- Contribution of reform movements in 19th and 20th century: Brahma Samaj, Arya Samaj, Gandhian and Vinoba Bhave.

Unit-III

- Social work and related concepts: social service, social services, social reform, social welfare, social development.

Unit-IV

- Programme and services for family welfare, children welfare, women welfare, youth welfare and aged welfare at national level.

List of Readings:

- | | |
|-----------------------------|--|
| 1. Dasgupta , S Ed. (1967) | Towards a Philosophy of Social Works in India, Popular Book service, New Delhi. |
| 2. Desai, Murli, (2006) | Ideologies and social Work: Historical and Contemporary analyses, Rawat Publication, New Delhi |
| 3. Friedlander, W.A. (1964) | Concepts and Methods of Social Work, Prentice-Hall. of India Pvt, Ltd. New Delhi. |
| 4. Gore, M.S. (1965) | Social Work and Social Work Education Asia Publishing |

House, Bombay

5. Roy, Sanjay (2011) Introduction to Social Work and practice in India. Akansha Publication House New, Delhi.
6. Singh Surendra and Srivastava S. P. (ed) 2005) Social Work Education Challenge and opportupnities, New Royal Book Publications Lucknow
7. Shastri , R.R.(1996) Social Work tradition in India, Welfare Forum & Research Organization, Varanasi
8. Mishra, P.D. Social Work: Profession in India, New Royal Book Company

Table 1: Scale of mapping between COs and POs/PSOs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course
(Basics of Social Work)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	3	3	3	2	3	3	3	3	3	3	3
2	3	3	3	3	3	2	3	3	3	3	3	3
3	2	3	3	3	3	3	3	3	3	3	3	2
4	3	3	3	3	3	3	3	3	3	3	3	3
Average	2.75	3	3	3	2.75	2.75	3	3	3	3	3	2.75

Table 3: CO-PSO matrix for the course
(Basics of Social Work)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
1	3	3	3	2	3
2	3	3	2	2	3
3	3	3	3	3	3
4	3	3	3	3	3
Average	3	3	2.75	2.50	3

Paper-II

Methods of Social Work

Max. Marks: 50
Total hours: 2 hr
Total credits: 2 Credits

Course Outcome:-

At the end of the course, the students will be able to:-

CO	Equip with theoretical knowledge for working with individuals and families and community.
CO	Understand the basic elements of community organization and social action.
CO	Develop conceptual understanding of administrative matters in the area of welfare and development.
CO	Develop scientific approach to conduct simple research projects/exercises.

Unit- I

- Social Case Work : concept, meaning, basic assumptions, objectives, principles , process of Social Case Work

Unit-II

- Social Group Work: concept, meaning, basics assumptions, objectives, principles and process of Social Group work.

Unit-III

- Community Organization: concept, meaning, basic assumptions, objectives, principles and process of Community Organization.
- Social Action: concepts, meaning, principles, types

Unit-IV

- Social Welfare Administration: concept, meaning, functions, principles
- Social Work Research : concepts, nature and steps

List of Readings:

- | | |
|----------------------|---|
| 1. Banarjee, G.R. | TISS Series 23. Papers on Social Work: An Indian Perspective; Tata Institute of Social Science, Mumbai. |
| 1. Florence, H.1964 | Case Work: A Psycho social therapy, Random House, New York. |
| 2. Goldstein, H.1970 | Social Work Practice: A Unitary Approach, Carolina: University. of S.Carolina Press. |

3. Grace, Mathew, 1992 Introduction to School Case Work, Tata Institute of Social Sciences, Mumbai
4. Mishra, P.D.1985 Samajik Vijyaktik Sewa Karya (Hindi) Uttar Pradesh Hindi. Sansthan, Lucknow
5. Perlman, 1957 Social Case Work-A Problem solving Process, Chicago: The University of Chicago Press, V Impression.
6. Pathak, S.H. 1966 Records in Social Case Work, Delhi School of Social Work, Delhi
7. Upadhyay, R.K. 1991 Samajik Vijyaktik Karya (Hindi) Haryana Sahitaya Academy, Chandigarh.
8. Upadhyay, R.K. 1993 Indian Philosophical Concepts in Clinical Social work, Kurukshetra Press, Kurukshetra.
9. Upadhyay, R.K. 2003 Social Case Work, Rawat Publications, New Delhi, Jaipur.
10. Siddiqui H.Y.2005 Group Work, theories and Practice, Rawat Publication New Delhi.
11. Trecker, Harleigh, B.1990 Social Group Work: Principles and Practice, New York: Association Press.
12. Pepell, C.P & Rothman B. Social Work with Groups, New York: The Haworth Press.
13. Ross M.G.1955 Community Organisation: Theory, Principles and Practice, New York: Harper and Brothers.
14. Siddiqui, H.Y.1997 Working with Communities: An Introduction to Community Work, New Dehli, Hira Publications.
15. Bhattacharya, Sanjai.2006 Social Work Administration and Development, Rawat Publications, Jaipur.

Table 1: Scale of mapping between COs and POs/PSOs

<u>Scale</u>	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO/PSO to a small extent) with the particular Program outcome/Program Specific Outcome.
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO/PSO to a reasonable extent) with the particular Program outcome/Program Specific Outcome.
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO/PSO to a large extent) with the particular Program outcome/Program Specific Outcome.

Table 2: CO-PO matrix for the course
(Methods of Social Work)

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	3	3	3	3	3	3	3	3	3	3	3
2	3	3	3	3	2	3	3	3	3	3	3	2
3	2	3	3	3	3	3	3	3	3	2	3	3
4	3	3	3	3	3	3	2	3	2	3	3	3
Average	2.75	3	3	3	2.75	3	2.75	3	2.75	2.75	3	2.75

Table 3: CO-PSO matrix for the course
(Methods of Social Work)

CO#	PSO1	PSO2	PSO3	PSO4	PSO5
1	3	3	3	3	3
2	3	3	2	2	3
3	3	3	3	3	3
4	3	3	3	3	3
Average	3	3	2.75	2.75	3

DEPARTMENT OF PUBLIC ADMINISTRATION
KURUKSHETRA UNIVERSITY KURUKSHETRA
(Established by the State Legislature Act XII of 1956)
(‘A+’ Grade NAAC Accredited)



Course Curriculum
B.A.(General) in Public Administration
Choice Based Credit System (CBCS)
Subject: PublicAdministration

DEPARTMENT OF PUBLIC ADMINISTRATION
KURUKSHETRA UNIVERSITY KURUKSHETRA (HARYANA)

2020-2021

Scheme of Examination & Syllabus for B. A. (General) under

(Choice Based Credit System)/LOCF

Subject: Public Administration

Scheme of Examination (w.e.f. 2020-2021)

Total Credit= 86

Minimum Credit required for UG Degree=50

Maximum Marks:150 Time: 3 Hours

Theory:120 Marks

Internal Assessment: 30 Marks (Division of Marks as given below)

One test/Seminar/Assignment (For each Paper) : 15 Marks

One test/Seminar/Assignment (For each Paper): 10 Marks

Attendance: 05 Marks

Marks of attendance will be given as under:-

- (1) 91% onwards: 5 Marks (2) 81% to 90%: 04 Marks
- (3) 75% to 80%: 03 Marks (4) 70% to 74%: 02* Marks
- (5) 65% to 69%: 01* Marks

* For students engaged in co-curricular activities of the University only/authenticated medical grounds duly approved by the concerned Principal.

Scheme of examination of the Course alongwith POs, PSOs, COs and Mapping Matrix

PROGRAMME OUTCOMES (POs):-

- PO 1:** Demonstrate a detailed knowledge and understanding of selected fields of study in core disciplines in the humanities, social sciences and languages;
- PO 2:** Apply critical and analytical skills and methods to the identification and resolution of problems within complex changing social context.
- PO 3:** Demonstrate a general understanding of the concepts and principles of selected areas of study outside core disciplines of the humanities, social sciences and languages;
- PO 4:** Apply and independent approach to knowledge that uses rigorous methods of inquiry and appropriate theories;
- PO 5:** Articulate the relationship between diverse form of knowledge and the social, historical and cultural context that produced them;
- PO 6:** Communicate effectively and show ability to read, write, listen to and speak in chosen languages with fluency;
- PO 7:** Act as informed and critically discerning participants within the community of scholars, as citizens and in the work force;
- PO 8:** Work with independence, self-reflection and creativity to meet goals and challenge in the workplace and personal life.

PROGRAMME SPECIFIC OUTCOMES (PSOs):-

- PSO1:** The students would be able to understand the basic concepts, need & growth of the discipline
- PSO2:** The program would provide the critical reasoning and analysis of key issues alongwith different concepts of administration.
- PSO3:** The students would be able to apply the theoretical interpretations to administrative system as well as they will acquire skill to identify social issues through scientific enquiry.
- PSO4:** The students would be able to have analytical and empirical understanding of administrative phenomena which leads to formulate the administrative planning and policies.

The Course of Public Administration in B.A. has been divided into Six Semesters spread over three years. Every students has to pass 50 credits (24 Core Courses+2 Credits of skill Enhancement Course+ 12 Credits of Discipline Specific Elective and 6 Credits in V Semester & 6 Credits in VI Semester from other Department i.e. Generic Elective Paper as necessary to complete the course under CBCS Scheme out of 86 credits. However, the choice of Discipline Specific Elective Credits is subjected to the availability of teaching faculty in the institution. The paper scheme details semester-wise is as follow:

**Scheme of Examination & Syllabus for the Course of B.A. (General), Public Administration, Semester
System under CBCS/LOCF to be introduced at IIHS W.E.F. 2020-2021 in phased manner.**

Semester	Courses	Paper	Nomenclature of the paper	Credits	Time Contact hrs Theory+ Tutorial	Internal Assessment Marks	External Marks	Total Marks	Duration of Exam.
I	CC- Public Administration	B-PAD-101	Elements of Public Administration	6	5+1	30	120	150	3 hours
II	CC- Public Administration	B-PAD-201	Public Personnel Administration	6	5+1	30	120	150	3 hours
III	CC- Public Administration	B-PAD-301	Public Financial Administration	6	5+1	30	120	150	3 hours
	SEC-1 Public Administration	B-PAD SEC-1	Any one of the following:	Credit Only = 2	Only = 2	Only = 10	Only = 40	Only = 50	
			1.Digital Governance	2	2	10	40	50	3 hours
			2. Management of NGOs	2	2	10	40	50	3 hours
			3.Training of Community Resource Persons	2	2	10	40	50	3 hours
IV	CC- Public Administration	B-PAD-401	Indian Administration	6	5+1	30	120	150	3 hours
V	DSE-A Public Administration	B-PAD	Any one of the following:						
		B-PAD 501	1.Comparative Public Administration	6	5+1	30	120	150	3 hours
		B-PAD 502	2. Rural Local Governance	6	5+1	30	120	150	3 hours
		B-PAD 503	3. Research Methods	6	5+1	30	120	150	3 hours
		OR							
		B-PAD-504	**MOOC Course from Swayam Portal	6	-	-	-	-	3 hours
	GE-1	B-PAD-GE-1-(101)	Elements of Public Administration	6	5+1	30	120	150	3 hours
VI	DSE-B Public Administration	B-PAD-	Any one of the following:						
		B-PAD-601	1.Development Administration	6	5+1	30	120	150	3 hours
		B-PAD-602	2. Disaster Management	6	5+1	30	120	150	3 hours
		B-PAD-603	3.Administrative Ethics and Governance	6	5+1	30	120	150	3 hours
		B-PAD-604	4. Urban Local Governance	6	5+1	30	120	150	3 hours
	GE-2	B-PAD-GE-2-(301)	Public Financial Administration	6	5+1	30	120	150	3 hours
				86	80	400	1600	2000	

Abbreviation: CC: Core Courses,(DSE):Discipline Specific Elective, (SEC): Skill Enhancement Course, GE: Generic Elective,

****MOOC Course from Swayam Portal CAN OPTED ONLY WHEN University approves the same from time to time.**

SEMESTER – I
CORE COURSE (CC)
Code: B-PAD-101
Elements of Public Administration

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :

Course outcomes (COs):-

- B-PAD- 101.1 Student will be able to awareness about the evolution and growth of the discipline of Public Administration.
- B-PAD- 101.2 Students will learn about the basic principles and approaches of Public Administration.
- B-PAD- 101.3 Students will acquire theoretical clarity of basic concepts and basis principles of organization
- B-PAD- 101.4 Student will gain knowledge about the forms of Organizations: Formal and Informal

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

Unit-I

Public Administration: Evolution, Meaning, Nature, Scope, Significance and its relations with Political Science, Economics and Law; Public and Private Administration; New Public Administration; and New Public Management.

Unit-II

Organization: Meaning and Basis. Principles of Organization: Hierarchy, Span of Control, Co-ordination, Supervision and Control, Communication, Decentralization and Delegation.

Unit-III

Forms of Organizations: Formal and Informal, Department, Board, Corporation and Commission and Independent Regulatory Commission.

Unit-IV

Chief Executive: Meaning, Types and Role. Line, Staff and Auxiliary Agencies. Public Relations: Meaning, Means and Significance.

Reference:

- Avasthi, A and Maheshwari, S R (2013) PublicAdministration. Lakshmi NarainAgarwal: Agra
- Basu, Rumki (2008) PublicAdministration: Concepts and Theories. Sterling Publishers: New Delhi
- Bhagwan, Vishnoo; Bhushan, Vidhya and Mohla, Vandana (2010) PublicAdministration. S. Chand: Jalandhar
- Bhambri, C. P. (2010) PublicAdministration Theory and Practice(21stEdition). Educational Publishers: Meerut
- Bhattacharaya, Mohit (2008) New Horizons of PublicAdministration. Jawahar Publishers and Distributors: New Delhi
- Henry, Nicholas(2013). PublicAdministration and Public Affairs (13thEdition). Taylor and Francis: New York
- Laxmikanth, M (2011) PublicAdministration. Tata McGraw: New Delhi
- Medury, Uma (2010) PublicAdministration in the Globalization Era – The New Public Management Perspective. Orient Blackswan: New Delhi
- Sharma, M P and Sadana, B L (2000) PublicAdministration in Theory and Practice. KitabMahal: New Delhi

Mapping Matrix of Course B-PAD/101

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/101) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/101

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/101.1	3	3	2	3	3	3	2	3
B-AD/101.2	3	3	2	3	3	3	2	3
B-AD/101.3	3	3	2	3	3	3	2	3
B-AD/101.4	3	3	2	3	3	3	2	3
Average	3	3	2	3	3	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/101) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M-SOCC-101

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/101.1	3	3	3	2
B-AD/101.2	3	3	3	2
B-AD/101.3	3	3	3	2
B-AD/101.4	3	3	3	2
Average	3	3	3	2

SEMESTER – II
CORE COURSE (CC)
Code: B-PAD-201
Public Personnel Administration

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :

Course outcomes(COs):-

- B-PAD- 201.1 The students would learn about the evolution and growth theories of Organization
- B-PAD- 201.2 The students would learn about familiarity with the Personnel Administration framework on which Indian administration is based.
- B-PAD- 201.3 It will help the students grasping the role of Recruitment, Classification, Training, Promotion, Conduct Rules, Disciplinary Actions of Personnel Administration
- B-PAD- 201.4 Students will acquire Delineating the constitutional provisions and dynamics of Administrative and Legislative agencies

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

Unit-I

Public Personnel Administration – Concept, Nature, Scope, and Significance. Bureaucracy: Meaning, Concepts, Types, Recent Trends and Its Role in Modern Society. Public Services and their Importance in Modern Society.

Unit-II

Personnel System in India with reference to: Recruitment, Classification, Training, Promotion, Service Conditions and Conduct Rules, Disciplinary Actions and Removal and Appeals, Retirement Benefits.

Unit-III

Personnel System in UK with reference to Recruitment, Classification, Training, Promotion, Conduct Rules, Disciplinary Actions, Removal and Appeals and Retirement Benefits.

Unit-IV

Personnel System in France and USA with Reference to Recruitment, Classification, Training, Promotion, Disciplinary Actions; Removal; and Appeals and Retirement Benefits. Political Rights and Rights to Strike of Civil Servants in USA .

Reference:

- Arora, Ramesh K. and Goyal, Rajni (1997) Indian PublicAdministration: Institutions and Issues. New Age International Publishers: New Delhi
- Avasthi, A and Avasthi, A P (2004) Indian Administration. Laksmi Narain Aggarwal: Agra
- Basu, D D (2013) Introduction to the Constitution of India (21st Edition). Lexus Nexus: New Delhi
- Chakraborty, Bidyut (2016) Indian Administration. Sage: New Delhi
- Cott, J E Woola (1986) British Rule in India. Anmol: Delhi
- Fadia, B L and Fadia, Kuldeep (2017) Indian Administration, (New Edition). Sahitya Bhawan: Agra
- Ghuman, B S; Monga, Anil and Johal, RamanjitKaur (Eds.) (2012) Corruption and Quality of Governance: Experiences of Select Commonwealth Countries. Aalekh Publishers: Jaipur
- Maheshwari, S R (2000) Indian Administration. Orient Longman: New Delhi
- Palmer, N D (1961) Indian Political System. George Allen and Unwin : London
- Sharma, M (2007) Indian Administration. Anmol: New Delhi
- Sharma, Prabhu Datta and Sharma, B M(2009) Indian Administration: Retrospect and Prospect. Rawat Publications: Jaipur

Mapping Matrix of Course B-PAD/201

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(**CO-PO Mapping Matrix**)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/201) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/201

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/201.1	3	3	2	3	3	3	2	3
B-AD/201.2	3	3	2	3	3	3	2	3
B-AD/201.3	3	3	2	3	3	3	2	3
B-AD/201.4	3	3	2	3	3	3	2	3
Average	3	3	2	3	3	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(**CO-PSO Mapping Matrix**)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/201) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/201

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/201.1	3	3	3	2
B-AD/201.2	3	3	3	2
B-AD/201.3	3	3	3	2
B-AD/201.4	3	3	3	2
Average	3	3	3	2

SEMESTER – III
CORE COURSE (CC)
Code: B-PAD-301
Public Financial Administration

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :

Course outcomes(COs):-

B-PAD-301.1 The students would be conceptual clarity about features of Indian Administrative systems and other terms covering various aspects of Indian administration

B-PAD-301.2 Detailed understanding of the President, Prime Minister & Council of Ministers & Central Secretariat and Cabinet Secretariat.

B-PAD-301.3 Critical understanding the issues of Organisation and Role of Ministries

B-PAD-301.4 Knowledge about the civil service in Indian administration

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

Unit-I

Financial administration. Budget: Concept of Budget, Budgetary Process – Formulation, Enactment and Execution, Performance Budgeting, Zero Based Budgeting. E-Governance and Financial Administration.

Unit-II

Fiscal Federalism in India. Objectives of the Fiscal Policy; Interdependence of Fiscal Policy and Monetary Policies. Centre-State Financial Relations in India. Tax Administration: Characteristics of Good Tax System; Structure at Union level; Problems and Suggestions.

Unit-III

Development Financial Institutions: IFCI; IDBI, SFC; Working Capital: Concept, Component, Importance. Factors Affecting Working Capital Requirement. Financial Control Agencies: Parliamentary Financial Control, Public Accounts Committee, Estimates Committee, Committee on Public Undertaking.

Unit-IV

Finance Ministry: Organisation and Working. Accounting and Audit System in India: Role of Comptroller & Auditor-General (CAG). Reserve Bank of India: Organisation and Functions, Monetary Policy and Instruments of Credit Control. Indian Money Market (IMM): Composition, Features and Reforms.

Reference:

- A Sarapa,: Public Finance in India, Kanishka Publishers Distributors, New Delhi, 2004.
Manjusha Sharma & O.P.Bohra, Bhartiya Lok Vitta Prashasan, Ravi Books, Delhi 2005
B.P. Tyagi: Public Finance, Meerut, Jai Prakash Nath 1997.
G.S.Lal: Financial Administration in India, New Delhi, HPJ Kapoor, 1987.
MJK Thavaraj: Financial Administration in India, Delhi: Sultan Chand & Sons, 1996.
Andley, Sundharam: Public Finance, Agra: Rattan Prakashan Mandir, 1979.
Ruddar Dutt & K.P.Sundharam: Indian Economy, New Delhi, S. Chand & Co. Pvt. Ltd. 1997
M.Y.Khan and P.K.Jain: Finance Management, New Delhi, Tata McGraw Hill 1982.
R.N. Srivastava: Management of Financial Institutions, Bombay, Himalaya Publishing House, 1988.
C.P.Bhambhri: Public Administration in India, Bombay: Vikas Publishing House, 1973.
S.L.Goel, Public Financial Administration, New Delhi, Deep & Deep Publications, 2004.
Dutt and Sundharam: Indian Economy, Delhi: S.Chand & Co.2004.

Mapping Matrix of Course B-PAD/301

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/301) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/301

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/301.1	3	3	2	3	3	3	2	3
B-AD/301.2	3	3	2	3	3	3	2	3
B-AD/301.3	3	3	2	3	3	3	2	3
B-AD/301.4	3	3	2	3	3	3	2	3
Average	3	3	2	3	3	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/301) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/301

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/301.1	3	3	3	2
B-AD/301.2	3	3	3	2
B-AD/301.3	3	3	3	2
B-AD/301.4	3	3	3	2
Average	3	3	3	2

SEMESTER – III
Skill Enhancement Course: (SEC-1)
Course Code: B-PAD/ SEC-1
(1) Digital Governance

Maximum Marks-50
Theory- 40
Internal Assessment Marks- 10
Time- 3 hours
L:T:FW
Credit:2:0:0=2

After completion of the course the student will be able to :

Course outcomes (COs)

B-PAD- SEC-1.1 It would help the students to acquired fundamental knowledge of e-governance and digital governance.

B-PAD-SEC-1.2 It would enable students to understands the Legal Framework, Issues & Challenges for e-Governance: IT ActComprehend policy formulation for DG

B-PAD-SEC-1.3 Students will get insight about an overview of action plans for various services&Digital Governance Policy Formulation.

B-PAD-SEC-1.4 It would impartunderstands about Digital Action Plan for civic services and transactional services.

Note: - The Paper setter shall set 8 questions, 10 marks each from all four units of the syllabus giving internal choice. The examinees have to attempt four questions in all.

UNIT - I

Conceptual constructs: Meaning, scope and importance – difference between e-governance and digital governance; Digital transformation continuum;Paradigm shifts

Digital Strategies for Governance: Principles of improving digital services; Benefits of digitizing; Digital capability strategies.

UNIT - II

Legal Framework, Issues & Challenges for e-Governance: I T Act – 2001 (ICT Act and important features of the Act); Information and Cyber Security. e-Readiness; Digital Divide (Gender, Geographic, Economic, Social and Political); Challenges; Resistance to Change,

UNIT - III

Digital Governance Policy Formulation: Principles of Public policy formulation for Digital Governance; Policy formulation for digital assets; Information sharing in government-digital tools

UNIT - IV

Digital Governance Policy Implementation: Digital Action Plan for civic services and transactional services; Implementation Impediments of Digital Governance-Factors influencing Digital Governance; Digital Efficiency Report; Case Studies – international and national (e.g. OECD; Wipro etc.)

References:

Anttiroiko, Ari-veikko andMalkia, Matti (2006) Encyclopedia of Digital Governance. IGI Global Publications: Pennsylvania, USA

Bélanger, F and Carter,L (2006) The Effects of the Digital Divide on e-Government: An Empirical Evaluation, Proceedings of the 39th Hawaii International Conference on System Sciences, Vol. 4, pp. 1-7

Biesdorf, S and Niederman, F (2013) Healthcare's digital future. McKinsey & Company: New York

Dunleavy, Patrick; Margetts, Helen; Bastow Simon; and Tinkler, Janae(2007) Digital Era Governance – IT Corporations, the State and e-Governments Oxford University Press: Oxford

Fang,Z (2002) e-Government in Digital Era: Concept, Practice and Development. International Journal of the Computer, the Internet and Information, Vol. 10, No. 2, pp. 1-22

- Landsbergen, D (2010) Government as Part of the Revolution: Using Social Media to Achieve Public Goals, *Electronic Journal of e-Government*, Vol. 8, No. 2, pp. 135- 147
- Mickoleit, A (2014) Social media use by governments: A policy primer to discuss trends, identify policy opportunities and guide decision makers. *OECD Working Papers on Public Governance*, No. 26. OECD Publishing: Paris
- Milakovich, Michael E (2012) *Digital Governance: New Technologies for Improving Public Service*. Addison-Wesley: Boston
- Sharma, Sangeeta(2006). Ecology of e-governance in *Encyclopedia of Digital Government* by Ari veikko (Author, Editor), Matti, Malkia (Author, Editor), pp. 423-31. IGI Global: Pennsylvania

Mapping Matrix of Course B-PAD/ SEC-1

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/ SEC-1) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/ SEC-1

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/301.1	3	3	3	3	3	3	2	3
B-AD/301.2	3	3	3	3	3	3	2	3
B-AD/301.3	3	3	3	3	3	3	2	3
B-AD/301.4	3	3	3	3	3	3	2	3
Average	3	3	3	3	3	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/SEC-1) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/ SEC-1

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-PAD/ SEC-1.1	3	3	3	2
B-PAD/ SEC-1.2	3	3	3	2
B-PAD/ SEC-1.3	3	3	3	2
B-PAD/ SEC-1.4	3	3	3	2
Average	3	3	3	2

SEMESTER – III
Skill Enhancement Course: (SEC-1)
Course Code: B-PAD/ SEC-1
(2) Management of NGOs

Maximum Marks-50
Theory- 40
Internal Assessment Marks- 10
Time- 3 hours
L:T:FW
Credit:2:0:0=2

After completion of the course the student will be able to :

Course outcomes (COs)

B-PAD/SEC-1.1 The students would be able to understand the comprehending the theoretical conceptualization of NGOs and the Public Sector

B-PAD/SEC-1.2 Students will acquire critically understanding the National Policy on Voluntary Sector and Government-NGO interface

B-PAD/SEC-1.3 Students will Learn about the Knowledge of Issues, Accountability, Mechanism & Problems of NGOs

B-PAD/SEC-1.4 It will help the students understanding capacity Case Studies: Self Employed Women's Association

Note: - The Paper setter shall set 8 questions, 10 marks each from all four units of the syllabus giving internal choice. The examinees have to attempt four questions in all.

UNIT - I

Non-Governmental Organisations (NGOs): Concept, Rationale and Scope; National Policy on the Voluntary Sector 2007; NGO-Government Interface in India with special reference to the NITI Ayog, Ministries and Departments.

UNIT - II

Organisational Forms and Governance Structures of NGOs: Trust; Society; Company; NGO-Government & NGO-Private sector partnerships: Rationale and practice; Sources of NGO Funding; Government and Foreign Grants: Eligibility, Requirements & Procedures with special reference to Foreign Contributions

UNIT - III

Issues, Accountability, Mechanism & Problems: Issues of Governance; Capacity Building; Autonomy; Ethics. Accountability of NGOs: Rationale, Mechanisms and Problems; Formulation of a Welfare/Development Project Proposal including Monitoring and Evaluation arrangements.

UNIT - IV

Case Studies: Self Employed Women's Association (SEWA): Organisation, Functions and Working; Red Cross Society of India: Organisation, Functions and Working; Voluntary Action Network India (VANI); and OXFAM India

References:

Bava, N (Ed.) (1997) Non-Government Organisations in Development: Theory and Practice. Kanishka Publishers: New Delhi

Chandra, Suresh (2015) Non-Government Organisations. Rawat: Jaipur

Chatterjee, A (1998) NGOs: An Alternative Democracy in Hiranmay Karlekar Independent India:

Gangrade, K D and Jain S (1995) NGOs: Retrospect and Prospect. Friedrich Ebert Stiftung: New Delhi

Government of India (1994) An Action Plan to bring about Collaborative Relationship between Voluntary Organizations and Government. CAPART, Government of India: New Delhi (Available at: <http://pcserver.nic.in/ngo/reports.aspx>)

Government of India (2007) Report of the Steering Committee on Voluntary Sector for the Eleventh Five-Year Plan. Planning Commission: New Delhi

- Handy, C (1990) Understanding Voluntary Organizations – How to make them Function Effectively?. Penguin Books: London
- Jain, N (2009) Handbook for NGOs: An Encyclopaedia for Non-Governmental Organisations and Voluntary Agencies, (I & II). Nabhi Publications: New Delhi
- Jain, R B (1995) NGOs in Development Perspective. Vivek Prakashan: New Delhi
- Kalima, R. (1992). Where Women are Leaders: The Sewa Movement in India. Vistaar Publications: New Delhi
- Khaira, Dahlia (2017) Appreciation & Evaluation of MGNREGA in Punjab. Adroit Publishers: New Delhi
- Meher, Nanavaty and Kulkarni P (1998). NGOs in the Changing Scenario. Uppal Publishing House: New Delhi

Mapping Matrix of Course B-PAD/ SEC-1

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/ SEC-1) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/ SEC-1

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/301.1	3	3	3	3	3	3	2	3
B-AD/301.2	3	3	3	3	3	3	2	3
B-AD/301.3	3	3	3	3	3	3	2	3
B-AD/301.4	3	3	3	3	3	3	2	3
Average	3	3	3	3	3	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/SEC-1) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/ SEC-1

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-PAD/ SEC-1.1	3	3	3	2
B-PAD/ SEC-1.2	3	3	3	2
B-PAD/ SEC-1.3	3	3	3	2
B-PAD/ SEC-1.4	3	3	3	2
Average	3	3	3	2

SEMESTER – III
Skill Enhancement Course: (SEC-1)
Course Code: B-PAD/ SEC-1
(3) Training of Community Resource Persons

Maximum Marks-50
Theory- 40
Internal Assessment Marks- 10
Time- 3 hours
L:T:FW
Credit:2:0:0=2

After completion of the course the student will be able to :

Course outcomes (COs)

B-PAD/ SEC-1.1 The students would be able to understand development of the ability to understand self, others and the society by gaining the conceptual understanding of youth issues, set of transferable skills, positive attitude to work

B-PAD/ SEC-1.2 Students will Learn about the knowledge of the capacity to deal with various social problems in professional manner by using scientific methods and approaches

B-PAD/ SEC-1.3 students would be able to facilitation of students to become capable to serve as an instrument for bringing transformation in the lives of youth and communities through research, policy, direct practice and teaching

B-PAD/ SEC-1.4 It will help the students become professional workers in designing, organizing and delivering services for bringing change in the lives of young people, especially the socially and economically disadvantaged categories.

Note: - The Paper setter shall set 8 questions, 10 marks each from all four units of the syllabus giving internal choice. The examinees have to attempt four questions in all.

UNIT – I

Introduction, Education and Employability/Skill Development: Community: Definition; Approaches/ Models and Theories of Community. Steps in Planning, Monitoring and Evaluation of Community Programmes and Projects. Job Description of Community Resource Person. Community Engagement/Service, Participation and Civic Engagement in Governance.

UNIT - II

Recruitment and Qualifications of a Community Resource Person. Training: Significance, Types and Role of Community Trainers. Challenges faced by community Resource Persons. Soft Skills, Leadership and Managerial Skills, Social Entrepreneurship, Career Guidance. Enablement and Capacity Building for Disadvantaged Youth.

UNIT – III

Inclusion and Social Justice, Health and Healthy Lifestyle: Social Concern and Tolerance, Gender Equity, Economic opportunities for marginalized and disadvantaged youth. Healthy Lifestyle and Nutrition, Preventive Care (Prevention and Control of non-communicable diseases like Diabetes, Hypertension. Participation, Engagement and Governance: Youth and Socio-Political Responsibilities,

UNIT - IV

Cancer, Coronary Vascular Disorders and Strokes), Promotion of Emotional and Mental Health among Youth, Awareness and Prevention of High Risk Behaviour among Youth (substance abuse, smoking, alcoholism, STI, STD, HIV/AIDS etc.)

References:

Banerjee, G R (1967) Concept of Being and Becoming in the Practice of Social Work. Indian Journal of Social Work, Tata Institute of Social Sciences: Mumbai
Bhattacharya, Sanjay (2008) Social Work an Integrated Approach. Deep & Deep Publications: New Delhi
Gangrade, K.D (1971) Community Organization in India. Popular Prakashan: Bombay
Mukherjee, Amitava (Ed.) (1995) Participatory Rural Appraisal, Methods and Application in Rural Planning. Vikas Publishing House: Delhi.

Mapping Matrix of Course B-PAD/ SEC-1

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/ SEC-1) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/ SEC-1

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/301.1	3	3	3	3	3	3	2	3
B-AD/301.2	3	3	3	3	3	3	2	3
B-AD/301.3	3	3	3	3	3	3	2	3
B-AD/301.4	3	3	3	3	3	3	2	3
Average	3	3	3	3	3	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/SEC-1) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/ SEC-1

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-PAD/ SEC-1.1	3	3	3	2
B-PAD/ SEC-1.2	3	3	3	2
B-PAD/ SEC-1.3	3	3	3	2
B-PAD/ SEC-1.4	3	3	3	2
Average	3	3	3	2

SEMESTER – IV
CORE COURSE (CC)
Code: B-PAD-401
Indian Administration

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :

Course outcomes (COs)

B-PAD-401.1 Students will be equipped with the knowledge and conceptual clarity of approaches, constitutional frame work of states in India

B-PAD-401.2 The students would learn about familiarity with the accountability mechanisms of State Secretariat .

B-PAD-401.3 Students will get insight about understanding of local governmental system in Indian Administration.

B-PAD-401.4 Students will acquire understanding of organisation, Role and Functions of Superintendent of Police and other functionaries.

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

Unit-I

Evolution of Indian Administration: Ancient, Mughal Period and British ; Features of Indian Administration, Political Executive at the Union Level: President; Prime Minister; and Council of Ministers. The Cabinet Secretariat and Central Secretariat. Administrative Reforms.

Unit-II

Administrative Organisation and Functions of Ministry of Home, Defence and External Affairs. Administration of Law and Order at Centre State and District Levels. Board and Commissions: Railways Board And Finance Commission. Centre-State Relations — Legislative, Administrative, Financial.

Unit-III

Public Services: All India Services; Central and State Services – Classification, Recruitment, Training, and Promotion. Service Rules and Political Rights of Civil Servants. Central Personnel Agency- Union Public Service Commission. Integrity in Administration.

Unit: IV

State and District Administration: Governor, Chief Minister and Council of Ministers. State Administration; State Secretariat and Chief Secretary, District Administration: District Collector, Powers, Functions and his Changing Role. District Rural Development Agency and Special Development Programmes. Administration for welfare of SCs and STs. Lok Pal & Lok Ayukt.

References: G.P. Piloni & Hoshier Singh: Administration & Social Changes, Jaipur: Printwell Publishers, 1985.

Avasthi: Central Administrative, Tata McGraw Hill, Publishers Co. Pvt. Ltd. 1988, New Delhi.

R.B.Jain: Contemporary Issues in Indian Administration, Delhi: Vishal Publishers, 1976.

S.R.Maheshwari: Indian Administration, Delhi: Orient Longman, 1989.

C.P. Bhambri: Public Administration in India, Delhi, Vikas 1973.

V. Bhaskara Rao and b. Venkateswarlu (ed.): Parliamentary Democracy in India: Trends and Issues, Delhi, Mittal Pub. 1987.

Pramatama Sharan: Public Administration in India, Meerut: Meenakshi Publications, 1978

Mapping Matrix of Course B-PAD/401

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(**CO-PO Mapping Matrix**)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/401) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/401

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/401.1	3	3	2	3	2	3	2	3
B-AD/401.2	3	3	2	3	2	3	2	3
B-AD/401.3	3	3	2	3	2	3	2	3
B-AD/401.4	3	3	2	3	2	3	2	3
Average	3	3	2	3	2	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(**CO-PSO Mapping Matrix**)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/401) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/401

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/401.1	3	2	3	2
B-AD/401.2	3	2	3	2
B-AD/401.3	3	2	3	2
B-AD/401.4	3	2	3	2
Average	3	2	3	2

SEMESTER – V
Discipline Specific Elective (DSE-A)
Code: B-PAD-501
(1) Comparative Public Administration

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :

Course Outcomes

B-PAD-501.1 It would impart understanding about the knowledge and conceptual of comparative Public Administration

B-PAD-501.2 The students would be able to understand the issues of approaches, indices, and models of comparative Public Administration

B-PAD-501.3 It would enable students to understand about the administrative systems and their accountability mechanisms of UK, USA and France

B-PAD-501.4 Students will acquire understanding of local governmental system, grievance redressal mechanisms and relevance of comparative approach in globalized perspective

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

UNIT - I

Introduction: Comparative Public Administration: Meaning, Nature, Scope and Significance. Salient Features of Administration in Developed & Developing Countries: Social, Economic, Political and Administrative

UNIT - II

Approaches: Structural Functional Approach; Behavioural Approach; and Ecological Approach

UNIT – III

Administrative Systems & Accountability : Salient features of Administration in UK, USA, Japan, Chief Executive of UK, USA, Japan. Accountability: Control Machinery of UK, USA, Japan.

UNIT - IV

Local government of UK, USA, Japan. Grievance Redressal Machinery of UK, USA, Japan. Relevance of Comparative Public Administration in the era of Liberalization, Privatization and Globalization

References:

- Arora, R K and Sharma, S (Eds.) (1992) Comparative and Development Administration: Ideas and Actions. Arihant Centre for Administrative Change: Jaipur
- Bhatt, A and Ranjan, R (2010) Comparative Government and Politics (1st Edition). Anmol Publications: New Delhi
- Chaturvedi, T N (1994) Tulnatmak LokPrashashan. College Book Depot: Jaipur
- Dahiya, Sewa Singh and Singh, Ravindra (2012) Comparative Public Administration. Sterling Publishers: New Delhi
- Farazmand, A (Ed.) (2001) Handbook of Comparative and Development Public Administration (2nd Edition). Marcell Dekker: New York
- Heady, Ferrel (2001) Public Administration: A Comparative Perspective (6th Edition). Marcel Dekker: New York
- Nadkarni, Vidya and Noonan, Norman C (Eds.) (2013) Emerging Powers in a Comparative Perspective: The Political and Economic Rise of the BRIC Countries. Bloomsbury Academic: London
- Ray, S N (2004) Modern Comparative Politics: Approaches, Methods and Issues. Prentice Hall of India: New Delhi
- Riggs, F W (1964) Administration in Developing Countries: The Theory of Prismatic Society. Houghton Mifflin Co.: Boston
- Special Issue on Comparative Chinese/American Public Administration (December 2009) Public Administration Review, Vol. 69, Issue S1. Wiley: New Delhi.

Mapping Matrix of Course B-PAD/501

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/501) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/501

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/401.1	3	3	2	3	2	3	2	3
B-AD/401.2	3	3	2	3	2	3	2	3
B-AD/401.3	3	3	2	3	2	3	2	3
B-AD/401.4	3	3	2	3	2	3	2	3
Average	3	3	2	3	2	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/501) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/501

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/501.1	3	3	3	2
B-AD/501.2	3	3	3	2
B-AD/501.3	3	3	3	2
B-AD/501.4	3	3	3	2
Average	3	3	3	2

SEMESTER – V
Discipline Specific Elective (DSE-A)
Code: B-PAD-502
(2) Rural Local Governance

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :
Course Outcomes (Cos)

B-PAD-502.1 Acquiring the theoretical knowledge and understanding of the evolution and growth of rural local governance with special reference to Panchayati raj institutions

B-PAD-502.2 Gaining insights about composition, role and functions, resources of Panchayati raj institutions

B-PAD-502.3 Connecting the role and relationships of rural local democratic decentralized institutions (PRIs) with other related issues and institutions

B-PAD-502.4 Knowledge of Issues: Panchayati Raj Finance; Devolution of powers, functions

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

UNIT – I

Introduction: Evolution and Growth of rural local governance in India focusing on constitutional provisions, community development program and committees and commissions on Panchayati raj constituted by the Government of India.

UNIT - II

Panchayati Raj Institutions: 73rd Constitutional Amendment Act, 1992; Gram Sabha – composition, functions and role; Gram Panchayat – composition, functions and role; Panchayat Samiti – composition, functions and role; and Zila Parishad – composition, functions and role

UNIT - III

Institutional Framework for PRIs: District Rural Development Agency; District Planning Committee; State Election Commission; State Finance Commission

UNIT - IV

Issues: Panchayati Raj Finance; Devolution of powers, functions and Activity Mapping; Panchayati Raj Bureaucracy in Rural Development.

Reference:

- Agarwal, Amba (2005) Fiscal Decentralization: Financing of Panchayati Raj Institutions in India. Serial Publications: New Delhi
- Baluchamy, S (2004) Panchayati Raj Institutions. Mittal Publications: New Delhi
- Bhadouria, B D S and Dubey, V P (1989) Panchayati Raj and Rural Development. Commonwealth Publishers: New Delhi
- Biju, M R (2008) Panchayati Raj System in India: A Symbol of Participatory Democracy and Decentralized Development. Kaniska Publication: New Delhi
- Dharmaraj, Sengmalam (2008) Panchayati Raj System in India. Abhijeet Publications: New Delhi
- Dube, M P and Padalia, Munni (Eds.) (2002) Democratic Decentralization and Panchayati Raj in India. Anamika Publishers: New Delhi
- Hochgesang, Thomas W (1994) Rural Local Self-Government in India. NIRD: Hyderabad
- Jayal, Niraja Gopal; Prakash, Amit and Sharma, Pradeep Kumar (2007) Local Governance in India – Decentralisation and Beyond, Oxford University Press: New Delhi
- Khanna, B S (1992) Rural Development in South Asia. Deep and Deep : New Delhi
- Maheshwari, S R (2015) Local Government in India. Lakshmi Narain Agarwal: Agra
- Maheswari, Shriram (2016) Local Government in India, Lakshmi Narain Agarwal: Agra

Mapping Matrix of Course B-PAD/502

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/502) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/502

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/401.1	3	3	2	3	2	3	2	3
B-AD/401.2	3	3	2	3	2	3	2	3
B-AD/401.3	3	3	2	3	2	3	2	3
B-AD/401.4	3	3	2	3	2	3	2	3
Average	3	3	2	3	2	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/502) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/502

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/501.1	3	3	3	2
B-AD/501.2	3	3	3	2
B-AD/501.3	3	3	3	2
B-AD/501.4	3	3	3	2
Average	3	3	3	2

SEMESTER – V
Discipline Specific Elective (DSE-A)
Code: B-PAD-503
(3) Research Methods

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :

Course Outcomes (COs)

B-PAD-503.1 The students would learn about the theoretical Development of an intellectual understanding of the fundamental knowledge of research methodology.

B-PAD-503.2 The students would learn about familiarity with the comprehend the research process in an appropriate manner

B-PAD-503.3 It would help the students to acquired inculcation of the necessary skills to use research tools to undertake research study

B-PAD-503.4 It would impart understands about competence to evaluate governmental policy or programme/projects on the basis of primary and secondary data

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

UNIT - I

Foundations of Public Administration Research: Key concepts in research methods; Types of research; Research process – Defining research problem, steps of research and application of research methods in Public Administration; Hypothesis; Current trends in research

UNIT - II

Research Design: Concept and importance; Types of research designs; Application of various types of research designs in Public Administration; Problems of research design

UNIT – III

Scientific Method, Measurement and Sampling Techniques: Concept of scientific method; Measurement and scaling concept; Basics of sampling and types of sampling

UNIT – IV

Data Collection, Processing and Analysis: SSRT-Observation method, Questionnaire, Interview; Case Study method; Secondary data analysis; Data preparation, Analysis and Report writing.

References:

- Kothari, C R and Garg, G (2018) Research Methodology: Methods and Techniques. New Age International Publishers: New Delhi
- Kumar, Ranjit (2011) Research Methodology: A Step by Step Guide for Beginner. Sage Publications: London
- McNabb, David E (2017) Research Methods in Public Administration and Non profit Management (4th Edition). Routledge: UK
- Miller, G J and Yang, K (Eds.) (2007) Handbook of Research Methods in Public Administration. CRC Press: New York
- Nachmias, C V and Nachmias, D (2005) Research Methods in Social Sciences. Hodder Headline Group: London
- Young, de Tim and Perlman, Bruce J (1984) Teaching Research Methodology in Public Administration. Teaching Political Science, Vol.11, Issue 2, pp. 63-69

Mapping Matrix of Course B-PAD/503

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/503) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/503

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/501.1	3	3	2	3	2	3	2	3
B-AD/501.2	3	3	2	3	2	3	2	3
B-AD/501.3	3	3	2	3	2	3	2	3
B-AD/501.4	3	3	2	3	2	3	2	3
Average	3	3	2	3	2	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/503) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/503

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/501.1	3	3	3	2
B-AD/501.2	3	3	3	2
B-AD/501.3	3	3	3	2
B-AD/501.4	3	3	3	2
Average	3	3	3	2

SEMESTER – V
DISCIPLINE SPECIFIC ELECTIVE: (DSE-A)
Course Code: B-PAD-504 **Credit: 6**

One of the MOOC Course available on Swayam Portal (UGC).

SEMESTER – V
Generic Elective (GE-1)
Code: B-PAD-101
Elements of Public Administration

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :

Course outcomes (COs):-

- B-PAD-101.1 Student will be able to awareness about the evolution and growth of the discipline of Public Administration.
- B-PAD-101.2 Students will learn about the basic principles and approaches of Public Administration.
- B-PAD-101.3 Students will acquire theoretical clarity of basic concepts and basis principles of organization
- B-PAD-101.4 Student will gain knowledge about the forms of organizations: Formal and Informal

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

Unit-I

Public Administration: Evolution, Meaning, Nature, Scope, Significance and its relations with Political Science, Economics and Law; Public and Private Administration; New Public Administration; and New Public Management.

Unit-II

Organization: Meaning and Basis. Principles of Organization: Hierarchy, Span of Control, Co-ordination, Supervision and Control, Communication, Decentralization and Delegation.

Unit-III

Forms of Organizations: Formal and Informal, Department, Board, Corporation and Commission and Independent Regulatory Commission.

Unit-IV

Chief Executive: Meaning, Types and Role. Line, Staff and Auxiliary Agencies. Public Relations: Meaning, Means and Significance.

References:

- Avasthi, A and Maheshwari, S R (2013) PublicAdministration. Lakshmi NarainAgarwal: Agra
- Basu, Rumki (2008) PublicAdministration: Concepts and Theories. Sterling Publishers: New Delhi
- Bhagwan, Vishnoo; Bhushan, Vidhya and Mohla, Vandana (2010) PublicAdministration. S. Chand: Jalandhar
- Bhambri, C. P. (2010) PublicAdministration Theory and Practice(21stEdition). Educational Publishers: Meerut
- Bhattacharaya, Mohit (2008) New Horizons of PublicAdministration. Jawahar Publishers and Distributors: New Delhi
- Henry, Nicholas(2013). PublicAdministration and Public Affairs (13thEdition). Taylor and Francis: New York
- Laxmikanth, M (2011) PublicAdministration. Tata McGraw: New Delhi
- Medury, Uma (2010) PublicAdministration in the Globalization Era – The New Public Management Perspective. Orient Blackswan: New Delhi
- Sharma, M P and Sadana, B L (2000) PublicAdministration in Theory and Practice. KitabMahal: New Delhi

Mapping Matrix of Course B-PAD/101

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/101) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/101

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/101.1	3	3	2	3	3	3	2	3
B-AD/101.2	3	3	2	3	3	3	2	3
B-AD/101.3	3	3	2	3	3	3	2	3
B-AD/101.4	3	3	2	3	3	3	2	3
Average	3	3	2	3	3	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/101) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/101

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/101.1	3	3	3	2
B-AD/101.2	3	3	3	2
B-AD/101.3	3	3	3	2
B-AD/101.4	3	3	3	2
Average	3	3	3	2

SEMESTER – VI
Discipline Specific Elective (DSE-B)
Code: B-PAD-601
Development Administration

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :

Course Outcomes (COs)

B-PAD-601.1 The students would learn about familiarity with the basic intellectual understanding of development, its approaches and sustainable development

B-PAD-601.2 It would help the students to acquire conceptual and theoretical understanding of development administration including the ecological and post-globalization contexts

B-PAD-601.3 Students will get insight about familiarity with issues/new perspectives such as Public Private Partnership, Corporate Social Responsibility,

B-PAD-601.4 It would enable students to understand Development, Sustainable Development Goals and Human Development Indicators

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

UNIT - I

Introduction: Development and its dimensions; Development and Modernization; Problems and Prospects of Development. Approaches of Development. Sustainable Development.

UNIT - II

Conceptual Constructs: Development Administration – concept, nature, scope and objectives; Features and Significance of Development Administration; Contribution of Ralph Braibanti, Edward Weidner, Fred W. Riggs and Dwight Waldo

UNIT - III

Issues: Globalization and Development Administration; Emergence of Non-State Actors in Development Administration; Gender Parity in Development; Role of Bureaucracy in Development

UNIT – IV

New Perspectives of Development: Public Private Partnership; Corporate Social Responsibility; Inclusive Development; Sustainable Development Goals (SDGs); Human Development Indicators and Social Audit

Reference:

Barnett, A Doak and Riggs, Fred Warren (1970) Frontiers of Development Administration. Duke University Press: USA.
Dwivedi, O P (1994) Development Administration: From Under-development to Sustainable Development. Macmillan: UK
Palekar, S L (2012) Development Administration, PHI Learning: New Delhi
Puri, K K and Barara, G S (2013) Development Administration in India (Hindi). Bharat Prakashan: Jalandhar
Ramulu, Ch. Bala (2016) Governance of Food Security Policies in India, Kalpaz Publications: New Delhi
Ramulu, Ch. Bala (2000) Technology and Rural Development, Rawat Publications: Jaipur
Ramulu, Ch. Bala (1999) International Organizations and Rural Employment Programs in India: Emerging Trends. Om Publishers: Faridabad, New Delhi
Sapru, R K (2008) Development Administration. Sterling : New Delhi

Mapping Matrix of Course B-PAD/601

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/601) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/601

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/401.1	3	3	2	3	2	3	2	3
B-AD/401.2	3	3	2	3	2	3	2	3
B-AD/401.3	3	3	2	3	2	3	2	3
B-AD/401.4	3	3	2	3	2	3	2	3
Average	3	3	2	3	2	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/601) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/601

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/401.1	3	2	3	2
B-AD/401.2	3	2	3	2
B-AD/401.3	3	2	3	2
B-AD/401.4	3	2	3	2
Average	3	2	3	2

SEMESTER – VI
Discipline Specific Elective (DSE-B)
Code: B-PAD-602
Disaster Management

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :

Course Outcomes (COs)

B-PAD602.1 Functioning of Disaster Management Organisation, Methodology to cope with Disaster in India

B-PAD602.2 Gaining conceptual and theoretical understanding of Development Administration including the ecological and post-globalization contexts

B-PAD602.3 Gaining familiarity with issues/new perspectives such as Public Private Partnership, Corporate Social Responsibility,

B-PAD602.4 Inclusive Development, Sustainable Development Goals and Human Development Indicators

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

Unit-I

Meaning and Classifications of Disasters, Functioning of Disaster Management Organisation, Methodology to cope with Disaster in India, Disaster Management Cycle, Disaster Management- Recent Trends, Impact of Natural Disasters on Environment and Development.

Unit-II

Disaster Mitigation, Basic Principles and Elements of Disaster Mitigation, Flood mitigation Practices in India, Action Plan for Earthquake Disaster Mitigation, Cost-Benefit Consideration of Mitigation, Resource Analysis and Mobilization.

Unit-III

Disaster Prevention and Preparedness, Vulnerability Analysis and Risk Assessment, Role of Community in Disaster Management, Communication Systems and Protocol, Legislation/ Existing Laws. Disaster Awareness, Role of Disaster Managers, Role of NGOs, Training of Disaster Managers, Use of Formal Education System, Emerging Issues and Lessons for Future.

Unit-IV

Rehabilitation and Reconstruction, Strategies for Effective Disaster Management, Skill Training-search, Rescue and Evacuation, Distribution of Relief Material, Emergency Operation Centers, Damage Assessment, Temporary Shelters and Warehousing Stock Pilling.

References:

1. V.K. Sharma: Disaster Management, New Delhi: New United Process, A-26 Narain INDL Area Phase-II, 1995.
2. David Alexander: Natural Disaster, London: UCL Press, 1993.
3. Kathakali Bagchi S: Drought Prone India: Problems and Prospects: New Delhi: Agricale, 1991.
4. Melvin A Benarde: Race against Famine Orient Longmans, Bombay, 1972.
5. Gopal Bhargana: Environmental Challenges and Ecological Disaster- Global Prospective, New Delhi, Mittal Pub., 1992.
6. V.V Borkar: Impact of drought on Rural Life, New Delhi: Popular Prakashan, 1975.
7. W. Nick Carter: Disaster Management: A Disaster Managers Handbook, Manila Asian Development Bank, 1995.
8. Jack D Kartez: Crisis Response Planning: Forward a Contingent Analysis, Journal of The American Planning Association 50 (1), Winter, 1984.

Mapping Matrix of Course B-PAD/602

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/602) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/602

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/401.1	3	3	2	3	2	3	2	3
B-AD/401.2	3	3	2	3	2	3	2	3
B-AD/401.3	3	3	2	3	2	3	2	3
B-AD/401.4	3	3	2	3	2	3	2	3
Average	3	3	2	3	2	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/602) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/602

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/401.1	3	2	3	2
B-AD/401.2	3	2	3	2
B-AD/401.3	3	2	3	2
B-AD/401.4	3	2	3	2
Average	3	2	3	2

SEMESTER – VI
Discipline Specific Elective (DSE-B)
Code: B-PAD-603
Administrative Ethics and Governance

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :
Course Outcomes (COs)

B-PAD-603.1 An understanding about the philosophy of ethics with special reference to ethics in Public life and accountability of Public services

B-PAD-603.2 Enhanced problemsolving skills in situations involving integrity, probity in Public life and acquiring problem solving approach

B-PAD -603.3 Capacity to logically and effectively communicate on ethics and governance

B-PAD-603.4 Ethics in Public Life: Civil Service Neutrality and Anonymity

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

UNIT - I

Introduction: Ethics – concept and significance; Key concepts – Right, Duty, Freedom, Equality, Fraternity, Karma, Purusharthas, and Dharma. Contribution of Kautilya: Character Building, Measures to tackle Corruption; Contribution of Mahatma Gandhi –Satyagraha and Truth.

UNIT - II

Applied Ethics: Issues of Inequality, Abortion, Foeticide, Suicide, Environment Degradation, Capital Punishment; and Nature of Moral Dilemmas., Contribution of Western Administrative Thinkers to Ethics with special reference to Socrates (Moral Theory) and Immanuel Kant (Deontological Theory)

UNIT - III

Ethics in Public Life: Civil Service Neutrality and Anonymity; Significance of Ethical and Moral Values in Governance. Code of Ethics and Code of Conduct for Civil Services in India

UNIT - IV

Probity in Governance: Corruption – Causes, Remedies; Institutional Arrangements for fighting Corruption in India: CVC, CBI, Lokpal and Lokayukta

References:

Arora, R K (2008) Ethics in Governance: Innovations Issues and Instrumentalities. Rawat: Jaipur
Arora, Ramesh K (Ed.) (2014) Ethics, Integrity and Values in Public Service. New Age International: New Delhi
Bhargava, R (2006) Politics and Ethics of the Indian Constitution. Oxford University Press: New Delhi
Chakraborty, Bidyut (2016) Ethics in Governance in India. Routledge: New Delhi
Chaturvedi, T N (Ed.) (1996) Ethics in Public Life. IIPA: New Delhi
Gandhi, Mahatma (2009) Hind Swaraj. Rajpal& Sons: Delhi
Godbole, M (2003) Public Accountability and Transparency: The Imperatives of Good Governance. Orient Longman: New Delhi
Hooja, R (2008) Corruption, Ethics and Accountability: Essays by an Administrator. IIPA: New Delhi
Mathur, B P (2014) Ethics for Governance: Reinventing Public Services. Routledge Taylor and Francis Group: New Delhi
Rangarajan, L N (Ed.) (1987) TheArthashastra. Penguin Books: New Delhi
Sawshilya, A (2012) Ethics and Governance. Pearson Education: New Delhi

Mapping Matrix of Course B-PAD/603

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/603) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/603

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/501.1	3	3	2	3	2	3	2	3
B-AD/501.2	3	3	2	3	2	3	2	3
B-AD/501.3	3	3	2	3	2	3	2	3
B-AD/501.4	3	3	2	3	2	3	2	3
Average	3	3	2	3	2	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/603) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/603

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/501.1	3	3	3	2
B-AD/501.2	3	3	3	2
B-AD/501.3	3	3	3	2
B-AD/501.4	3	3	3	2
Average	3	3	3	2

SEMESTER – VI
Discipline Specific Elective (DSE-B)
Code: B-PAD-604
Urban Local Governance

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :

Course Outcomes (COs)

B-PAD-604.1 The students would learn about the knowledge of the evolution and growth of urban local bodies in India

B-PAD-604.2 The students would learn about the composition, role, functions, and resources of urban local bodies

B-PAD-604.3 It would help the students to acquire the structure and working of urban development programmes

B-PAD-604.4 Students will get insight about Urban Development Programmes like AMRUT, NUHM etc.; SMART cities.

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based on entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

UNIT – I

Introduction: Evolution of Local Governance in India. Urbanization: Concept; Trends; Challenges and Remedies. Features of Urban Local Government in India,

UNIT - II

Organizational Framework for Urban Governance: 74th Constitutional Amendment Act; Structure, Composition and Functions of Metropolitan Committees, Municipal Corporations, Municipal Councils and Nagar Panchayats; State Finance Commission; State Election Commission

UNIT - III

Urban Development Programmes and Urban Governance: Urban Development Programmes like AMRUT, NUHM etc.; SMART cities and other recent trends; Sources of Finance of Urban Local Government; Personnel Administration; Bureaucracy and Local Governance

UNIT –IV

Issue Areas in Urban Governance: State-Local relations; Rural-Urban relations; Globalization and Urban governance; Administrative Reforms in Local Governance

References:

Ahluwalia, Isher Judge (2014) Transforming our Cities: Facing up to India's Growing Challenge: Postcards of Change. HarperCollins: New Delhi

Ahluwalia, Isher Judge; Kanbur, Ravi and Mohanty, P K (2014) Urbanization in India: Challenges, Opportunities and the Way Forward. Sage: New Delhi

Baud, I S A and Wit, J Dee (Eds.)(2008) New Forms of Urban Governance in India: Shifts, Models, Networks and Contestations. Sage: New Delhi

Bhattacharya, Mohit (1976) Management of Urban Government in India. Uppal: New Delhi

Burns, Dany; Hambleton, Robin and Hogget Paul (1994) The Politics of Decentralisation: Revitalising Local Democracy. Macmillan: London

- Chand, Mahesh and Puri, V K (2011) Regional Planning in India. Allied Publishers: New Delhi
- Dasgupta, Biplab; Buch, M N ; and Sivaramakrishanan, K C (Eds.) (1993) Urbanisation in India: Basic Services and People's Participation. Concept Publishing Company: New Delhi
- Ghuman, B S and Mehta, Akshat (2010) Privatisation of Public Services by Urban Local Governments in India: A Case Study of Municipal Council Panchkula, Nagarlok, Vol. XLII, No. 1, Pp. 50-68
- Jha, Gangadhar (2018) Fragile Urban Governance: Evolution, Decline, and Empowerment of Local Self-Government in India. Routledge:New York
- Kaur, Jaswinder (2017) Urban Infrastructure Development in India: A Case Study of JNNURM in Ludhiana. New Era Book Agency: Chandigarh
- Mani, N (2016) Smart Cities & Urban Development in India. New Century Publications: New Delhi.

Mapping Matrix of Course B-PAD/604

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/604) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/604

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/501.1	3	3	2	3	2	3	2	3
B-AD/501.2	3	3	2	3	2	3	2	3
B-AD/501.3	3	3	2	3	2	3	2	3
B-AD/501.4	3	3	2	3	2	3	2	3
Average	3	3	2	3	2	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/604) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/604

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/501.1	3	3	3	2
B-AD/501.2	3	3	3	2
B-AD/501.3	3	3	3	2
B-AD/501.4	3	3	3	2
Average	3	3	3	2

SEMESTER – VI
Generic Elective (GE-2)
Code: B-PAD-301
Public Financial Administration

Maximum Marks-150
Theory- 120
Internal Assessment Marks- 30
Time- 3 hours
L:T:FW
Credit:5:1:0=6

After completion of the course the student will be able to :

Course outcomes(COs):-

B-PAD-301.1 The students would be conceptual clarity about features of Indian Administrative systems and other terms covering various aspects of Indian administration

B-PAD-301.2 Detailed understanding of the President, Prime Minister & Council of Ministers & Central Secretariat and Cabinet Secretariat.

B-PAD-301.3 Critical understanding of the issues of Organisation and Role of Ministries

B-PAD-301.4 Knowledge about the civil service in Indian administration

Note: - The Paper setter shall set 8 questions, 25 marks each from all four units of the syllabus giving internal choice. However, one compulsory question in addition is to be set under fifth unit based entire syllabus. This compulsory question would comprise four questions, 5 marks each. Such way, the examinees have to attempt five questions in all.

Unit-I

Financial administration. Budget: Concept of Budget, Budgetary Process – Formulation, Enactment and Execution, Performance Budgeting, Zero Based Budgeting. E-Governance and Financial Administration.

Unit-II

Fiscal Federalism in India. Objectives of the Fiscal Policy; Interdependence of Fiscal Policy and Monetary Policies. Centre-State Financial Relations in India. Tax Administration: Characteristics of Good Tax System; Structure at Union level; Problems and Suggestions.

Unit-III

Development Financial Institutions: IFCI; IDBI, SFC; Working Capital: Concept, Component, Importance. Factors Affecting Working Capital Requirement. Financial Control Agencies: Parliamentary Financial Control, Public Accounts Committee, Estimates Committee, Committee on Public Undertaking.

Unit-IV

Finance Ministry: Organisation and Working. Accounting and Audit System in India: Role of Comptroller & Auditor-General (CAG). Reserve Bank of India: Organisation and Functions, Monetary Policy and Instruments of Credit Control. Indian Money Market (IMM): Composition, Features and Reforms.

Reference:

- A Sarapa,: Public Finance in India, Kanishka Publishers Distributors, New Delhi, 2004.
Manjusha Sharma & O.P.Bohra, Bhartiya Lok Vitta Prashasan, Ravi Books, Delhi 2005
B.P. Tyagi: Public Finance, Meerut, Jai Prakash Nath 1997.
G.S.Lal: Financial Administration in India, New Delhi, HPJ Kapoor, 1987.
MJK Thavaraj: Financial Administration in India, Delhi: Sultan Chand & Sons, 1996.
Andley, Sundharam: Public Finance, Agra: Rattan Prakashan Mandir, 1979.
Ruddar Dutt & K.P.Sundharam: Indian Economy, New Delhi, S. Chand & Co. Pvt. Ltd. 1997
M.Y.Khan and P.K.Jain: Finance Management, New Delhi, Tata McGraw Hill 1982.
R.N. Srivastava: Management of Financial Institutions, Bombay, Himalaya Publishing House, 1988.
C.P.Bhambhri: Public Administration in India, Bombay: Vikas Publishing House, 1973.
S.L.Goel, Public Financial Administration, New Delhi, Deep & Deep Publications, 2004.
Dutt and Sundharam: Indian Economy, Delhi: S.Chand & Co.2004.

Mapping Matrix of Course B-PAD/301

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes:(**CO-PO Mapping Matrix**)

Table 2 shows the CO-PO mapping matrix for a course (B-PAD/301) assuming that there are 08 POs and 4COs.

Table 2: CO-PO Matrix for the Course B-PAD/301

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
B-AD/301.1	3	3	2	3	3	3	2	3
B-AD/301.2	3	3	2	3	3	3	2	3
B-AD/301.3	3	3	2	3	3	3	2	3
B-AD/301.4	3	3	2	3	3	3	2	3
Average	3	3	2	3	3	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes:(**CO-PSO Mapping Matrix**)

Table 3 shows the CO-PSO mapping matrix for a course (B-PAD/301- GE-2) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course B-PAD/301 -GE-2

CO	PSO 1	PSO 2	PSO 3	PSO 4
B-AD/301.1	3	3	3	2
B-AD/301.2	3	3	3	2
B-AD/301.3	3	3	3	2
B-AD/301.4	3	3	3	2
Average	3	3	3	2

Department of Political Science
Kurukshetra University Kurukshetra

**Syllabus and Scheme of Examination for M.A. Political Science under
(CBCS/LOCF)**

w.e.f. 2020-2021 in phased manner for regular students of UTD

Total Credits= 172

Minimum Credits required for the Masters Degree=84

Time : 03 Hours

Maximum Marks : 100 Marks

Theory : 80 Marks

Internal Assessment : 20 Marks, Division of Marks as given below:

One Test/ Seminar: 50% (For Each Paper)

One Class Test:25% (One Period Duration)

Attendance: 25%, Marks of attendance will be given as under:-

- * 91 % onwards : 05 Marks
- * 81% to 90% : 04 Marks
- * 75% to 80% : 03 Marks
- * 70 % to 74% : 02 Marks
- * 65 % to 69% : 01 Marks

- * For students engaged in co-curricular activities of the University only/ authenticated medical grounds duly approved by the concerned Chairperson.

Scheme of examination of the Course alongwith POs, PSOs, COs and Mapping Matrix

PROGRAMME OUTCOMES (POs):-

- PO 1 KNOWLEDGE :-** Demonstrate knowledge of historical emergence, questions asked, and distinctive contributions of the social science disciplines to the analysis of human behavior and social issues.
- PO 2 PROBLEM SOLVING:-** Visualize, conceptualize, articulate, and solve complex problems through experimentation and observation using theoretical framework of social science disciplines.
- PO 3 CRITICAL THINKING:-** Critically analyze everyday problems faced by the society, evaluate specific policy proposals, compare arguments with different conclusions to a specific societal issue, and assess the role played by assumptions in such arguments.
- PO 4 SCIENTIFIC ENQUIRY:-** Develop the capability of defining problems, formulate hypothesis, collect relevant data, develop empirical evidence and interpret the results of such analyses.
- PO 5 USAGE OF ANALYTICAL TOOLS:-** Develop the ability to apply appropriate quantitative/qualitative techniques used in social science disciplines along with ICT, softwares etc.
- PO 6 SPECIALIZATION AND EMPLOYABILITY: -** Develop deeper understanding, creativity, originality, analytical and critical skills in chosen specialized areas of social science disciplines leading to employability.
- PO 7 INTERDISCIPLINARY KNOWLEDGE & ADAPTATION:** Enhance the ability to integrate as well as synthesize the acquired knowledge within the social sciences and beyond.
- PO 8 SELF DIRECTED LEARNING: -** Develop the ability to work independently as well as effectively in the changing environment.
- PO 9 ETHICS:** Articulate and apply ethics, values and ideals that demonstrate awareness of current societal challenges.
- PO 10 LEADERSHIP: -** Build skills to work as part of a team and lead others, setting directions and formulating inspiring vision.
- PO 11 COMMUNICATION:** Communicate conclusions, interpretations and implications clearly, concisely and effectively, both orally and in writing for different types of audiences.
- PO 12 PROJECT MANAGEMENT: -** Use investigative skills necessary for conducting disciplinary- projects/ research documents/ term papers etc.

PROGRAMME SPECIFIC OUTCOMES (PSOs):-

- PSO1** The students will be able to have an in depth understanding of theoretical and conceptual underpinnings of politics to examine political behaviour.
- PSO2** The students will be able to develop the ability to comprehend and analyse political phenomena..
- PSO3** The students shall acquire the capacity to observe the politics through various perspectives.
- PSO4** The students will be able to comprehend and critically examine various institutions, issues, processes and challenges inherent in political system.

Scheme of Examination for M.A. Political Science w.e.f. 2020-21 in phased manner of the regular students of UTD.

The M.A. Examination in Political Science has been divided into four Semesters spread over two years. Every student has to pass 84 Credits (**48 Compulsory + 32 Optional**) out of 172 Credits and 4 Credits - 2 in Semester-II and 2 in Semester-III from Optional Elective Paper from Other Department) as necessary to earn the degree under the new scheme i.e. **Choice Based Credit System**.

In each semester, **20 (Compulsory + Optional)** Credits shall be offered to the students. In addition to this **One Optional Elective Paper from Other Department of 2 Credits each in Semester-II & III are required to earn the Masters Degree in Political Science**. However, the choice of Optional Credits is subject to the availability of teaching faculty in the Department. The semester-wise details of the paper scheme are as follows:

Course No.	Name of the Subject/Paper	No. of Credit	Teaching Scheme (Hrs/Week)			Examination Scheme (Marks)			Duration of Exam/ Time
			L	T	P	(Sem. Theory Exam)	Internal Assess-ment	Total	
M.A. (Previous) Semester-I Political Science									
M POL(C) – 01	Western Political Thought	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(C) - 02	Indian Government and Politics-I	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(C) - 03	International Relations-Theory	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(C) - 04	Public Administration-I	4	4	½ hrs/G	-	80	20	100	3 hrs
One paper to be chosen from any of the following (the corresponding option has to be taken in Semester-II)									
M POL(E) - 05-i	Research Methodology-I	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) - 05-ii	Political Geography	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) - 05-iii	Political Leadership	4	4	½ hrs/G	-	80	20	100	3 hrs
M.A. (Previous) Semester-II Political Science									
M POL(C) - 06	Indian Political Thought	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(C) - 07	Indian Government and Politics-II	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(C) - 08	International Relations-Issues	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(C) - 09	Public Administration-II	4	4	½ hrs/G	-	80	20	100	3 hrs
One paper to be chosen from any of the following (from the corresponding option was taken in Semester-I)									
M POL(E) - 10-i	Research Methodology-II	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) - 10-ii	Geo-Politics and World Affairs	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) - 10-iii	Media and Politics	4	4	½ hrs/G	-	80	20	100	3 hrs
OESS	Candidate is required to take one option elective, other than Political Sciences, from the Common lists of Papers of Social Sciences (Syllabus enclosed in the end)	2	2	-	-	-	-	50	2 hrs
M.A. (Final) Semester-III Political Science									
M POL(C) - 11	Political Theory-I	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(C) - 12	Comparative Politics-I	4	4	½ hrs/G	-	80	20	100	3 hrs
Paper-13, 14 & 15, Candidate has to choose any one group from the following Groups :									
Group A : Paper 13, 14 & 15									
M POL(E) – 13-i	India’s Foreign Policy & Relations-I	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 14-ii	International Law-I	4	4	½ hrs/G	-	80	20	100	3 hrs

M POL(E) – 15-iii	International Organization and Global Order Studies-I	4	4	½ hrs/G	-	80	20	100	3 hrs
Group B : Paper 13, 14 & 15									
M POL(E) – 13-i	Political Sociology : The Indian Context-I	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 14-ii	State Politics in India (with special reference to Haryana)–I	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 15-iii	Democracy in India-I	4	4	½ hrs/G	-	80	20	100	3 hrs
Group C : Paper 13, 14 & 15									
M POL(E) – 13-i	Government & Politics of USA-I	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 14-ii	USA and the World-I	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 15-iii	USA and South Asia	4	4	½ hrs/G	-	80	20	100	3 hrs
Group D : Paper 13, 14 & 15									
M POL(E) – 13-i	Ancient Indian Political Thought-I	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 14-ii	Modern Indian Political Thought-I	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 15-iii	Liberal Political Theory	4	4	½ hrs/G	-	80	20	100	3 hrs
OESS	Candidate is required to take one option elective, other than Political Sciences, from the Common lists of Papers of Social Sciences of the same subject as taken in Semester-II (Syllabus enclosed in the end)	2	2	-	-	-	-	50	2 hrs
M.A. (Final) Semester-IV Political Science									
M POL(C) - 16	Political Theory-II	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(C) - 17	Comparative Politics-II	4	4	½ hrs/G	-	80	20	100	3 hrs
Paper-18, 19 & 20, Candidate has to choose any one group from the following Groups :									
Group A : Paper 18, 19 & 20									
M POL(E) – 18-i	India's Foreign Policy & Relations-II	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 19-ii	International Law-II	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 20-iii	International Organization and Global Order Studies-II	4	4	½ hrs/G	-	80	20	100	3 hrs
Group B : Paper 18, 19 & 20									
M POL(E) – 18-i	Political Sociology : The Indian Context-II	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 19-ii	State Politics in India (with special reference to Haryana)–II	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 20-iii	Democracy in India-II	4	4	½ hrs/G	-	80	20	100	3 hrs
Group C : Paper 18, 19 & 20									
M POL(E) – 18-i	Government & Politics of USA-II	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 19-ii	USA and the World-II	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 20-iii	USA and Asia Pacific	4	4	½ hrs/G	-	80	20	100	3 hrs
Group D : Paper 18, 19 & 20									
M POL(E) – 18-i	Ancient Indian Political Thought-II	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 19-ii	Modern Indian Political Thought-II	4	4	½ hrs/G	-	80	20	100	3 hrs
M POL(E) – 20-iii	Recent Trends in Liberalism	4	4	½ hrs/G	-	80	20	100	3 hrs

Semester-I

M POL(C) – 01 Western Political Thought

Credits:04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the ideas of various western political thinkers whose work forms the core of Political Science as a discipline. It identifies ten political thinkers, from Plato to Marx, whose writings have shaped the understanding of ideas like the nature of state, society and politics.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|---------------|--|
| M POL(C)-01.1 | Assess the significance of political ideas of Plato, Aristotle and realist thinkers Like Machiavelli. |
| M POL(C)-01.2 | Critically evaluate the theory of Social Contract by Hobbes, Locke and Rousseau and the impact of their philosophy on the Constitutions of different countries. |
| M POL(C)-01.3 | Have comprehensive understanding of concepts of utilitarian thinkers like Bentham & J.S. Mill and writings of Marx and Hegel that have shaped the understandings of society, politics and economy. |
| M POL(C)-01.4 | Present their own arguments and thought about contemporary issues to solve them through logical validation. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

Unit-I Plato, Aristotle, Machiavelli.

Unit-II Hobbes, Locke, Rousseau.

Unit-III Bentham, J.S. Mill.

Unit-IV Hegel, Marx.

Suggested Readings

1. Sir E. Barker, *The Political Thought of Plato and Aristotle*, New York, Dover Publications, 1959.
2. Sir E. Barker, *Greek Political Theory: Plato and His Predecessors*, New Delhi, B.I. Publications, 1964.
3. Sir E. Barker, *The Politics of Aristotle*, (Translated with Introduction, Notes and Appendix), Oxford, Oxford University Press, 1995.
4. R.N. Berki, *The History of Political Thought: A Short Introduction*, London, Dent., 1977.
5. J.H. Burns (ed.), *The Cambridge History of Political Thought, 1450-1700*, Cambridge, Cambridge University Press, 1991.
6. H. Butterfield, *The Statecraft of Machiavelli*, New York, Collier, 1962.
7. A. Cobban, *Rousseau and the Modern State*, London, Unwin University Books, 1964.
8. J. Coleman, *A History of Political Thought: From Ancient Greece to Early Christianity*, London, Blackwell, 2000.
9. W.L. Davidson, *Political Thought in England: The Utilitarians from Bentham, to Mill*, Oxford, Oxford University Press, 1957.
10. M.B. Foster, W.T. Jones and L.W. Lancaster, *Masters of Political Thought*, 3 Vols., London, George G. Harrap and Co. Ltd., 1959.
11. R.G. Gettel, *History of Political Thought*, New York, Novell. & Co., 1924.
12. I.W. Hampsher-Monk, *Modern Political Thought from Hobbes to Marx. Oxford*, Basil Blackwell, 1992.
13. H.J. Laski, *Political Thought from Locke to Bentham*, Oxford, Oxford University Press, 1920.
14. S. Mukerjee and S. Ramaswamy, *A History of Political Thought: Plato to Marx*, New Delhi, Prentice Hall, 1999.
15. G.H. Sabine, *History of Political Theory*, 4th edn., Revised by T.L. Thorson, New Delhi, Oxford and IBH, 1973.
16. Shefali Jha, *Western Political Thought*, Pearson, New Delhi, 2012.
17. Bhargava and Acharya, *Political Theory: An Introduction*, Pearson, New Delhi, 2012.
18. Bhargava and Acharya/Choubey, *Rajniti Siddhant: Ek Parichay*, Pearson, New Delhi, 2012.
19. Kymlicka/Choubey, *Samkaleen Rajniti-Darshan: Ek Parichay*, Pearson, New Delhi, 2012.
20. Abbas, *Political Theory*, Pearson, New Delhi, 2012.

Mapping Matrix of Course M POL(C) – 01

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL(C) – 01) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(C) – 01

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(C)-01.1	3	3	3	-	-	3	2	2	3	2	2	3
M POL(C)-01.2	3	3	3	-	-	3	2	2	3	2	2	3
M POL(C)-01.3	3	3	3	-	-	3	2	2	3	2	2	3
M POL(C)-01.4	3	3	3	-	-	3	2	2	3	2	2	3
Average	3	3	3	-	-	3	2	2	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL(C) – 01) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(C) – 01

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(C)-01.1	3	3	3	2
M POL(C)-01.2	3	3	3	2
M POL(C)-01.3	3	3	3	2
M POL(C)-01.4	3	3	3	3
Average	3	3	3	2.25

M POL(C) – 02
Indian Government and Politics-I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at introducing the students to major political institutions that are integral to politics in India. Along with an introduction to the historical background of the Constitution of India, the paper acquaints the students with the functioning and dynamics of the Union and State governments, Judiciary, and the theory and practice of Federalism in India.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|---------------|---|
| M POL(C)-02.1 | Understand the historical evolution of India's constitution. |
| M POL(C)-02.2 | Comprehend the working of major political institutions that are integral to politics in India and the functioning and dynamics of the Union and State Governments. |
| M POL(C)-02.3 | Have deeper knowledge of jurisdiction of Supreme Courts and High Courts, the judicial rulings and judicial reforms. |
| M POL(C)-02.4 | Not only have theoretical understanding of Indian Federation but also develop analytical ability to establish a relationship between theory and practice of federalism. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

Unit-I Historical Background, Fundamental Rights & Duties, Directive Principles of State Policy, Constitutional Amendments.

Unit-II Union and State Government- President, Prime Minister, Cabinet and Council of Ministers.

State- Governor, Chief Minister.

Union Parliament and State Vidhan Sabha.

Local Government- Rural and Urban.

Unit-III Judiciary- Supreme Court and the High Courts.

Judicial Review, Judicial Activism including Public Interest Litigation Cases, Judicial Reforms.

Unit-IV Indian Federalism- Theory and Practice.
Demands for State Autonomy and Separatist Movements.
Political and Social Dimensions- Political Elites, Civil Society and Secularism.

Suggested Readings

1. G. Austin, *The Indian Constitution: Corner Stone of a Nation*, Oxford, Oxford University Press, 1966.
2. P. Bardhan, *The Political Economy of Development in India*, London, Oxford, Blackwell, 1984.
3. D.D.Basu, *An Introduction to the Constitution of India*, New Delhi, Prentice Hall, 1994.
4. C.P. Bhambri, *The Indian State: Fifty Years*, New Delhi, Shipra, 1999.
5. K.R. Bombwall, *The Foundations of Indian Federalism*, Bombay, Asia Publishing House, 1967.
6. P.R. Brass, *Politics of India Since Independence*, 2nd edn., Cambridge, Cambridge University Press, 1994.
7. N. Chandhoke, *Beyond Secularism: The Rights of Religious Minorities*, Delhi, Oxford University Press, 1999.
8. B.L. Fadia, *State Politics in India*, 2 Vols., New Delhi, Radiant, 1984.
9. A.Kaushik, *Democratic Concerns: The Indian Experience*, Jaipur, Alekh, 1994.
10. S.Kaviraj, *Politics in India, Delhi*, Oxford University Press, 1998.
11. A.Kohli (ed.), *India's Democracy: An Analysis of Changing State-Society Relations*, Princeton NJ, Princeton University Press, 1988.
12. A.Kohli, (ed), *The Success of India's Democracy*, Cambridge, Cambridge University Press, 2001.
13. R.Kothari, *Caste and Politics in India*, New Delhi, Orient Longman, 1970.
14. R. Kothari, *Politics in India*, New Delhi, Orient Longman, 1970.
15. W.H. Morris Jones, *Government and Politics in India*, Delhi, BI Publications, 1974.
16. M.V. Pylee, *An Introduction to the Constitution of India*, New Delhi, Vikas, 1998.
17. Abbas, *Indian Government and Politics*, Pearson, New Delhi, 2012.
18. Neera Chandoke, *Contemporary India*, Pearson, New Delhi, 2012.
19. Pravin Kumar Jha, *Indian Politics in Comparative Perspective*, Pearson, New Delhi, 2012.
20. Pravin Kumar Jha, *Tulnatamak Paripekchay Mein Bhartiya Rajniti*, Pearson, New Delhi, 2012.

Mapping Matrix of Course M POL(C) – 02

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	Contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	Contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL(C) – 02) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(C) – 02

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(C)-02.1	3	3	3	-	-	3	2	2	3	2	2	3
M POL(C)-02.2	3	3	3	-	-	3	2	2	3	2	2	3
M POL(C)-02.3	3	3	3	-	-	3	2	2	3	2	2	3
M POL(C)-02.4	3	3	3	-	-	3	2	2	3	2	2	3
Average	3	3	3	-	-	3	2	2	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL(C) – 02) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(C) – 02

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(C)-02.1	3	3	3	3
M POL(C)-02.2	3	3	3	2
M POL(C)-02.3	3	3	3	3
M POL(C)-02.4	3	3	3	3
Average	3	3	3	2.75

M POL(C) – 03
International Relations-Theory

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims to acquaint the students with major concepts and theories that are central to the understanding of contemporary International Relations. It explores the Nature, Scope and Development of International Relations, along with theories that are at the core of explanation to relations between states. The paper also has sections on International Security in Post-Cold War Era and Nature, Determinants and Instruments of Foreign Policy, among others.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|--------------|--|
| M POL(C)-3.1 | Have broad understanding of dynamic nature of international relations, its key concepts and types of International system. |
| M POL(C)-3.2 | Acquire comprehensive knowledge of mainstream theories that have shaped and influenced International politics and assess the relevance of these theories in present context. |
| M POL(C)-3.3 | Identify the concepts and core features of different theories emerged in post cold war world. |
| M POL(C)-3.4 | Acquire cognitive and analytical skills to apply theories to the question of International politics in practice. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

- | | |
|-----------------|--|
| Unit-I | Nature, Scope and Development of International Relations, Autonomy Debate.
Types of International Systems.
Concept of Power- Tangible and Intangible Elements, limitation of Power.
Interest, Ideology. |
| Unit-II | Mainstream Theories of International Relations-Realist, Liberalism and Neo-Liberalism Marxist, and World System. |
| Unit-III | Alternative Theories of International Relations Constructivism, Feminism, Critical International Relations Theory, Gandhian Approach. |
| Unit-IV | Decision Making and Bargaining Theory, System Approach, Game Theory. |

Suggested Readings

1. John, Baylis and Steve Smith, *Globalization of World Politics*, Oxford, London, 1997.
2. P.Allan and K. Goldman (eds.), *The End of the Cold War*, Dordrecht, Martinus Nijhoff, 1992.
3. D.G. Brennan (ed.), *Arms Control, Disarmament and National Security*, New York, George Braziller, 1961.
4. S. Burchill et. al., *Theories of International Relations*, Hamsphire, Macmillan, 2001.
5. I.Claude, *Power and International Relations*, New York, Random House, 1962.
6. A.A. Couloumbis and J.H. Wolf, *Introduction to International Relations: Power and Justice*, New York, Praegar, 1989.
7. W. Epstein, *The Last Chance: Nuclear Proliferation and Arms Control*, New York, The Free Press, 1976.
8. K.W. Deutsch, *The Analysis of International Relations*, New Delhi, Prentice Hall, 1989.
9. P.Gilbert, *Terrorism Security and Nationality*, London and New York, Routledge, 1995.
10. A.J.R. Groom and M. Lights (eds.), *Contemporary International Relations: A Guide to Theory*, London, Printer, 1993.
11. F. Halliday, *Revolution and World Politics: The Rise and Fall of the Sixth Great Power*, Basingstoke, Macmillan, 1999.
12. F. Halliday, *Rethinking International Relations*, Basingstoke, Macmillan, 1994.
13. R.O. Keohane (ed.), *Neo-realism and Its Critics*, New York, Columbia University Press, 1986.
14. H.J. Morgenthau, *Politics Among Nations*, 6th Edition, revised by K.W., Thompson, New York, Alfred Knopf, 1985.
15. M.S. Rajan, *Non-Alignment and the Non-Alignment Movement in the Present World Order*, Delhi, Konark, 1994.
16. J.N. Rosenau and K. Knorr (eds.), *Contending Approaches to International Politics*, Princeton NJ, Princeton University Press, 1969.
17. M.P. Sullivan, *Theories of International Politics: Enduring Paradigm in a Changing World*, Hamsphire, Macmillan, 2001.
18. S.P. Verma, *International System and the Third World*, New Delhi, Vikas, 1988.
19. Ajay Kumar, *Antarrashtriya Sambandhon Ke Siddhant*, Pearson, New Delhi, 2012.
20. Chimni et al, *International Relations*, Pearson, New Delhi, 2012.
21. Sanju Gupta, *An Introduction to International Relations*, Pearson, New Delhi, 2012.

Mapping Matrix of Course M POL(C) – 03

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL(C) – 03) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(C) – 03

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(C)-03.1	3	3	3	-	-	3	3	3	3	2	2	3
M POL(C)-03.2	3	3	3	-	-	3	3	3	3	2	2	3
M POL(C)-03.3	3	3	3	-	-	3	3	3	3	2	2	3
M POL(C)-03.4	3	3	3	-	-	3	3	3	3	2	2	3
Average	3	3	3	-	-	3	3	3	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL(C) – 03) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(C) – 03

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(C)-03.1	3	3	3	2
M POL(C)-03.2	3	3	2	2
M POL(C)-03.3	3	3	3	2
M POL(C)-03.4	3	3	3	2
Average	3	3	2.75	2

M POL(C) – 04
Public Administration-I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at introducing the students to the core elements of Public Administration as a discipline. It explores themes like the Meaning, Nature and Scope of Public Administration, Development of Public Administration as a Discipline along with various approaches to the study of Public Administration. It also has sections on Principles, Types and Forms of Organization, Chief Executive and Judicial and Legislative Control over Administration, among others.

Course Outcomes:

After the completion of this course, the students will be able to:

- M POL(C)-04 1. Understand the basics and the evolution of Public Administration.
- M POL(C)-04 2. Comprehend various approaches to the study of Public Administration and theories of organization.
- M POL(C)-04 3. Understand the principles types and forms of organization.
- M POL(C)-04 4. Comprehend the role of Executive, Judiciary and Legislature in Public Administration.

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

Unit-I Meaning, Nature and Scope of Public Administration.
Public and Private Administration.

Development of Public Administration as a Discipline; New Public Administration.

Unit-II Approaches to the Study of Public Administration- Ecological; Rational Decision Making, Development Administration and Political Economy, Liberal, Democratic and Marxist Frameworks.

Theories of Organization: Classical, Scientific, Human Relations.

Unit-III Principles of Organization- Line and Staff, Unity of Command, Hierarchy, Span of Control, Centralization and Decentralization.

Types of Organization -Formal and Informal

Forms of Organization: Department, Public Corporation and Board.

Unit-IV Chief Executive: Types, Functions and Roles.
Control Over Administration- Judicial and Legislative.
Impact of Liberalization and Information Technology on Public Administration.

Suggested Readings

1. J.E. Anderson, *Public Policy Making*, Boston, Houghton, Mifflin, 1990.
2. P.H., Appleby, *Public Administration for a Welfare State*, Bombay, Asia Publishing House, 1961.
3. A. Avasthi and S.N. Maheshwari, *Public Administration*, Agra, Laxmi N. Aggarwal, 1996.
4. P.R. Dubashi, *Recent Trends in Public Administration*, Delhi, Kaveri Books, 1995.
5. E.N. Gladden, *The Essential of Public Administration*, London, Staples Press, 1958.
6. J. La Palombara and M. Weiner (eds.), *Bureaucracy and Political Development*, Princeton NJ, Princeton University Press, 1966.
7. S.R. Maheshwari, *Administrative Theories*, New Delhi, Allied, 1994.
8. F.A. Nigro and L.S. Nigro, *Modern Public Administration*, New York, Harper and Row, 1984.
9. L. Peters, "Downsizing the Civil Service in Developing Countries: Golden Handshake or Smiling Farewells?" *Public Administration and Development*, 18(4), Oct. 1998, pp. 381-86.
10. D.C. Pitt, and B.C. Smith (eds.), *The Computer Revolution: The Impact of Information Technology on Government* Brighton, Wheatsheaf Books, 1984.
11. R. Presthus, *Public Administration*, New York, Ronald, 1975.
12. D. Waldo (ed.), *Ideas and Issues in Public Administration: A Book of Readings*, New York, McGraw Hill, 1953.
13. Hoshier Singh and Pradeep Sachdeva, *Public Administration*, Pearson, New Delhi, 2012.
14. Hoshier Singh and Pradeep Sachdeva, *Lok Prashasan*, Pearson, New Delhi, 2012.

Mapping Matrix of Course M POL(C) – 04

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL(C) – 04) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(C) – 04

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(C)-04.1	3	3	3	-	-	3	3	3	3	3	2	3
M POL(C)-04.2	3	3	3	-	-	3	3	3	3	3	2	3
M POL(C)-04.3	3	3	3	-	-	3	3	3	3	3	2	3
M POL(C)-04.4	3	3	3	-	-	3	3	3	3	3	2	3
Average	3	3	3	-	-	3	3	3	3	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL(C) – 04) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(C) – 04

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(C)-04.1	3	3	3	2
M POL(C)-04.2	3	3	3	3
M POL(C)-04.3	3	3	3	2
M POL(C)-04.4	3	3	3	3
Average	3	3	3	2.5

M POL(E) – 05-i
Research Methodology-I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper intends to enable the students to understand the nature of social research. While discussing various approaches to Social Science research, the paper acquaints the students with concepts like Models, Paradigms and Theories. It also explores themes like Scientific Method and the building blocks of Social Scientific Research, among others.

Course Outcomes:

After completing this course, the learners would be able to:

- | | |
|-------------------|---|
| M POL (E)- 05-i.1 | Understand the meaning, nature and types of social research along with various approaches. |
| M POL (E)- 05-i.2 | Comprehend the concept of model, paradigm and theory |
| M POL (E)- 05-i.3 | Grasp various methods used in carrying out research. |
| M POL (E)- 05-i.4 | Examine and assess the building blocks of research viz. hypothesis, concepts and variables. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

- | | |
|-----------------|---|
| Unit-I | Social Research- Its Nature and Types.
Traditional Approaches- Philosophical, Institutional, Marxian and Gandhian.
Behavioural Revolution in Political Science and its Criticism.
Post-Behaviouralism |
| Unit-II | Models, Paradigms and Theories- Conceptual and Theoretical Models.
Meaning and Types of Paradigms.
Theory-Meaning, Goals and Types.
Construction of a Theory and Relationship Between Theory and Research. |
| Unit-III | Scientific Method-Basic Assumptions, Steps and Limitation. Scientific Study of Political Science.
Historical Method, Comparative Method, Analytical Method and Psycho-Analysis.
Methods of Popper and Kuhn. |

Unit-IV The Building Blocs of Social Scientific Research-Hypotheses, Concepts and Variables, Generalization and Law.

Suggested Readings

1. H.N. Blalock, *An Introduction to Social Research*, Englewood Cliffs NJ, Prentice Hall, 1970.
2. J. Blondel, *Thinking Politically*, London, Wildwood House, 1976.
3. A. Bryman, *Quantity and Quality in Social Research*, London, Unwin Hyman, 1988.
4. A.F. Chalmers, *Science and Its Fabrication*, Milton Keynes, Open University Press, 1990.
5. J. Galtung, *Theory and Methods of Social Research*, New York, Columbia University Press, 1987.
6. A.Giddens, *Profiles and Critiques in Social Theory*, London Macmillan, 1982.
7. W.J. Goode and P.K. Hatt, *Methods of Social Research*, New York, McGraw Hill, 1952.
8. A.C. Isaak, *Scope and Methods of Political Science*, Homewood Illinois, Dorsey Press, 1985.
9. J.B. Johnson and R.A. Joslyn, *Political Science Research Methods*, Washington DC, C.Q. Press, 1986.
10. F.N. Kerlinger, *Behavioural Research*, New York, Holt, Rinehart and Winston, 1979.
11. T.Kuhn, *The Structure of Scientific Revolution*, Chicago, University of Chicago Press, 1970.
12. R. K. Merton (ed.), *Social Theory and Social Structure*, New York, The Free Press, 1957.
13. D. Miller (ed.), *Pocket Popper*, London, Fontana, 1997.
14. Sir, K.R. Popper, *The Logic of Scientific Discovery*, London, Hutchinson, 1959.
15. Sir, K. R. Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge*, London, Routledge and Kegan Paul, 1963.
16. Sir, K.R. Popper, *The Poverty of Historicism*, London, Routledge, 1991.
17. P.V. Young, *Scientific Social Surveys and Research*.
18. Robert A. Dahl, *Modern Political Analysis*, Englewood Cliffs, NJ Prentice Hall, 1963.

Mapping Matrix of Course M POL (E) – 05-i

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E) – 05-i) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 05-i

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-05-i.1	3	3	3	3	3	3	3	3	3	3	2	3
M POL(E)-05-i.2	3	3	3	3	3	3	3	3	3	3	2	3
M POL(E)-05-i.3	3	3	3	3	3	3	3	3	3	3	2	3
M POL(E)-05-i.4	3	3	3	3	3	3	3	3	3	3	2	3
Average	3	3	3	3	3	3	3	3	3	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E) – 05-i) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 05-i

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-05-i.1	3	3	3	2
M POL(E)-05-i.2	3	3	2	3
M POL(E)-05-i.3	3	3	3	2
M POL(E)-05-i.4	3	2	2	3
Average	3	2.75	2.5	2.5

M POL(E) – 05-ii
Political Geography

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims to acquaint the students with the history and development of Political Geography as a discipline. Along with the Models of World Structure and their Relevance, the paper also explores the global strategic views of thinkers like Mahan, Mackinder, Spykman, Hoosan etc along with various approaches to study Geographical thought.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|------------------|--|
| M POL(E)-05-ii.1 | Understand the historical evolution of Political Geography as a distinct discipline, its relation with other social sciences and the Geopolitical and Geo Strategic Structure of World. |
| M POL(E)-05-ii.2 | Critically analyze the various models of the world structure and their relevance in contemporary times; understand the significance and legality of boundaries through various case studies. |
| M POL(E)-05-ii.3 | Comprehend the global strategic views of prominent Political Geographers and the importance of air and naval power during war. |
| M POL(E)-05-ii.4 | Acquire deeper knowledge of various approaches to the study of Political Geography and Huntington's scheme of World divisions based on Civilizations. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

Unit-I History & Development, Nature and Scope of Political Geography.
Relation with other Social Sciences.
Geopolitical and Geostrategic Structure of the World.
International and Regional Dimension.

Unit-II Models of World Structure and their Relevance.
Boundary Studies-Type, Importance and Legal Status,
Boundaries as Barriers- Case Studies.

Unit-III Global Strategic Views-Mahan; Mackinder; Spykman, Hooson.
Global Strategy in Air and Ocean Age.

Unit-IV Approaches- Traditional, Functional and Generic
Unified field Theory.
Clash of Civilizations- Huntington's Scheme of World Divisions.

Suggested Readings

1. Charles C. Colby, ed., *Geographic Aspects of International Relations*.
2. J.P. Cole, *Geography and World Affairs*.
3. W. Gordon East and A.E. Moodie, eds., *The Changing World: Studies in Political Geography*.
4. Pascal Girot and Eleonore Kofman, eds., *International Geopolitical Analysis*.
5. C.S. Gray, *The Geopolitics of the Nuclear Era: Heartland, Rimland and the Technological Revolution*.
6. W.A. ZDoughlass Jackson, *Politics and Geographic Relationships*.
7. R. Paddison, *The Fragmented State: The Political Geography of Power*.
8. W.H. Parker, Mackiner: *Geography as an Aid to Statecraft*.
9. J.R.V. Prescott, *Political Geography of the Oceans*.
10. B.M. Russett, *International Regions and International System*.
11. R. Strausz-Hupe, *Geopolitics*.
12. B.L. Sukhwai, *Modern Political Geography*, Sterling Publishers, New Delhi, 1968.
13. Teter Taylor, *Political Geography*, Longmen, London, 1985.
14. Charles A. Fisher, *Essays in Political Geography*, Methuen, London, 1968.
15. N.J. G. Pounds, *Political Geography*, McGraw Hill, New York, 1972.
16. A.E. Moddie, *Geography Behind Politics*, Hutchnison, London, Latest Edition.
17. J.R.V. Prescott, *The Geography of Frontiers and Boundaries Aldine*, Chicago.
18. R.D. Dikshit, *Political Geography: A Contemporary Perspective*, Tata McGraw Hill, New Delhi, 1996.
19. R.D. Dikshit, *Political Geography: A Century of Process*, Sage, New Delhi, 1999.

Mapping Matrix of Course M POL (E) – 05-ii

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E) – 05-ii) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 05-ii

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-05-ii.1	3	3	3	-	-	3	3	3	3	2	2	3
M POL(E)-05-ii.2	3	3	3	-	-	3	3	3	3	2	2	3
M POL(E)-05-ii.3	3	3	3	-	-	3	3	3	3	2	2	3
M POL(E)-05-ii.4	3	3	3	-	-	3	3	3	3	2	2	3
Average	3	3	3	-	-	3	3	3	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E) – 05-ii) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 05-ii

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-05-ii.1	3	2	3	2
M POL(E)-05-ii.2	3	3	3	3
M POL(E)-05-ii.3	3	3	3	2
M POL(E)-05-ii.4	3	3	3	3
Average	3	2.75	3	2.5

M POL(E) – 05-iii
Political Leadership

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the theory and practice of political leadership with special reference to India. It also explores the issues and problems related to recruitment of leaders, Typologies of Power and Decision-Making and Political Leadership and Nation-Building in India.

Course Outcomes:

After the completion of this course, the students will be able to:

- M POL(E)-05-iii.1 Understand the comparativist perspective and approaches to study political leadership.
- M POL(E)-05-iii.2 Analyze various issues and problems of leadership recruitment and socialization.
- M POL(E)-05-iii.3 Understand the typologies of power and decision making.
- M POL(E)-05-iii.4 Develop an understanding of the relationship between political leadership and nation building in India.

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

Unit-I Study of Political Leadership-A Comparativist Perspective: Classical and Elite Views.

Psychological, Sociological and Political Approaches.

Leadership- Types, Roles, Style, Personality Traits, Functions, Performance.

Unit-II Issues and Problems of Recruitment and Situational Factors.

Issues and Problems of Socialization and Socialization Factors.

Unit-III Typologies of Power and Decision-Making, and Executive Authority.

Unit-IV Political Leadership and Nation-Building in India: Local, Regional and National Levels.

Suggested Readings

1. S.P. Aiyar and R. Srinivasan, eds., *Studies in Indian Democracy*.
2. Yogesh Atal, *Building a Nation: Essays on India*.
3. Marie C. Carras, *Indira Gandhi in the Crucible of Leadership*.
4. Sudipta Kaviraj, "Indira Gandhi and Indian Politics", *Economic and Political Weekly*", September 20-27, 1986.
5. W.H. Morris-Jones, ed., *The Making of Politicians: Studies from Africa and Asia*.
6. W.H. Morris-Jones, *Politics: Mainly Indian*.
7. Iqbal Narain, et al., *Political Elite in an Indian State*.
8. R.L. Park and I. Tinker, eds., *Leadership and Political Institutions in India*.
9. G. Ram Reddy and K. Seshadri, "Studies of Leadership", in ICSSR, *Survey of Research in Political Science*, Vol. I.
10. Arun Shourie, *Symptoms of Fascism*.
11. V.M. Sirsikar, "Political Leadership in India", *Economic Weekly*, March 20-27, 1965.
12. Janardan Thakur, *Indira Gandhi and Her Power Game*.
13. E. Victor Wolfenstein, *Personality and Politics*.

Mapping Matrix of Course M POL (E) – 05-iii

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E) – 05-iii) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 05-iii

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-05-iii.1	3	3	3	-	-	3	3	3	3	3	2	3
M POL(E)-05-iii.2	3	3	3	-	-	3	3	3	3	3	2	3
M POL(E)-05-iii.3	3	3	3	-	-	3	3	3	3	3	2	3
M POL(E)-05-iii.4	3	3	3	-	-	3	3	3	3	3	2	3
Average	3	3	3	-	-	3	3	3	3	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E) – 05-iii) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 05-iii

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-05-iii.1	3	3	3	3
M POL(E)-05-iii.2	2	3	3	2
M POL(E)-05-iii.3	3	3	3	2
M POL(E)-05-iii.4	2	3	3	3
Average	2.5	3	3	2.5

Semester-II

M POL(C) – 06 Indian Political Thought

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the ideas of various Indian political thinkers whose work forms the core of Indian Political Philosophy. It identifies ten political thinkers whose writings have shaped the understanding of ideas like nationalism, peace, equality and the like in contemporary Indian thinking.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|---------------|--|
| M POL(C)-06.1 | Have in depth knowledge and understanding of Indian Political thinkers like Manu and Kautilya. |
| M POL(C)-06.2 | Develop a comparative understanding of various social reformers. |
| M POL(C)-06.3 | Identify and describe the key ideas of Vivekananda and M.N. Roy |
| M POL(C)-06.4 | Develop an understanding of the ideas of Modern Indian Political thinkers. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

Unit-I Manu, Kautilya.

Unit-II Gokhle, Tilak, Raja Ram Mohan Roy.

Unit-III Vivekanand, M.N. Roy.

Unit-IV Gandhi, Nehru, Ambedkar

Suggested Readings:

1. A.S. Altekar, *State and Government in Ancient India*, Delhi, Motilal Banarsidass, 1966.
2. A.Appadorai, *Documents on Political Thought in Modern India*, 2 Vols., Bombay Oxford University Pres, 1970.
3. S. Ghose, *Modern Indian Political Thought*, Delhi, Allied, 1984.
4. U.N. Ghoshal, *A History of Indian Political Ideas*, London, Oxford University Pres, 1959.
5. K.P. Jayaswal, *Hindu Polity*, Calcuta, Butterworth, 1924.
6. R. P. Kangle, *Arthashastra of Kautilya*, Delhi, Motilal Bansarsidass, 1965.
7. M.J. Kanetkar, *Tilak and Gandhi: A Comparative Study*, Nagpur, Author, 1935.
8. V.B. Karnik, *M.N. Roy: Political Biography*, Bombay, Jagriti, 1978.
9. K. P. Karunakaran, *Modern Indian Political Tradition*, New Delhi, Allied Publishers, 1962.
10. V.R. Mehta, *Foundations of Indian Political Thought*, New Delhi, Manohar, 1992.
11. T. Pantham, and K. Deustch (eds), *Political Thought in Modern India*, New Delhi, Sage, 1986.
12. B. Parekh and T. Pantham (eds), *Political Discourse: Exploration in Indian and Western Political Thought*, New Delhi, Sage, 1987.
13. D.P. Roy, *Leftists Politics in India: M. N. Roy and the Radical Democratic Party*, Calcutta, Minerva, 1989.
14. B.S. Sharma, *The Political Philosophy of M.N. Roy*, Delhi, National Publishing House, 1965.
15. V.P. Verma, *Studies in Hindu Political Thought and its Metaphysical Foundations*, Delhi, Motilal Banarsidass, 1974.
16. Shefali Jha, *Western Political Though*, Pearson, New Delhi, 2012.
17. Bhargava and Acharya, *Political Theory: An Introduction*, Pearson, New Delhi, 2012.
18. Bhargava and Acharya/Choubey, *Rajniti Siddhant: Ek Parichay*, Pearson, New Delhi, 2012.
19. Kymlicka/Choubey, *Samkaleen Rajniti-Darshan: Ek Parichay*, Pearson, New Delhi, 2012.
20. Abbas, *Political Theory*, Pearson, New Delhi, 2012.

Mapping Matrix of Course M POL(C) – 06

Mapping: Mapping is a process of representing the correlation between COs and POs, Cos and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL(C)–06) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(C) – 06

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(C)-06.1	3	3	3	-	-	3	2	3	3	2	2	3
M POL(C)-06.2	3	3	3	-	-	3	2	3	3	2	2	3
M POL(C)-06.3	3	3	3	-	-	3	2	3	3	2	2	3
M POL(C)-06.4	3	3	3	-	-	3	2	3	3	2	2	3
Average	3	3	3	-	-	3	2	3	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL(C)–06) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(C) – 06

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(C)-06.1	3	3	3	2
M POL(C)-06.2	3	3	3	2
M POL(C)-06.3	3	3	3	2
M POL(C)-06.4	3	3	3	2
Average	3	3	3	2

M POL(C) – 07
Indian Government and Politics-II

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at introducing the students to the major political processes that are integral to politics in India. It explores themes like Historical Dimensions, Values and Legacies of Political Culture in India, the Nature of Party System, Political Economy Dimensions and Problems of Nation Building and Integration, among others.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|---------------|---|
| M POL(C)-07.1 | Comprehend the historical dimensions of Political culture, the values and legacies and social dimensions of Indian Political System. |
| M POL(C)-07.2 | Have in depth knowledge of changing nature of party system in India; the role played by parties and pressure groups in shaping the politics of India. |
| M POL(C)-07.3 | Understand the politics of economic development in India; Elections; and the role of media in shaping public opinion. |
| M POL(C)-07.4 | Analyze critically the impact of social factors on Indian Political System, challenges of Nation building and integration and develop insights on issues related to weaker sections of society. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

Unit-I Historical Dimensions of Political Culture.
Dominant Values and Traditions.
Political Legacies.
Social Composition and Sociological Foundations.

Unit-II Party System in India, National and Regional Parties.
Interest and Pressure Groups, Politics of Defections and
Anti-Defection Law. Coalition Politics-Bases, Nature and
Impact on Indian Polity.

Unit-III Political Economy Dimensions-Politics of Economic Development, Planning.

Elections and Electoral Behavior-Election Commission and Electoral Reforms, Role of Media and Public Opinion.
Politics of Violence.

Unit-IV Impact of Caste, Religion, Regionalism; Language.

Weaker Sections -SC, ST and OBC and Gender Issues.
Problems of Nation Building and Integration.
Emerging Trends in Indian Polity.

Suggested Readings :

1. B. Arora and D.V. Verney (eds.), *Multiple Identities in a Single State: Indian Federalism in a Comparative Perspective*, Delhi, Konark, 1995.
2. T.R. Andhyarujina, *Judicial Activism and Constitutional Democracy in India*, Bombay, N. M. Tripathi, 1992.
3. G. Austin, *Working on Democratic Constitution: The Indian Experience*, Delhi, Oxford University Press, 2000.
4. D.D.Basu, *An Introduction to the Constitution of India*, New Delhi, Prentice Hall, 1994.
5. U. Baxi and B. Parekh (ed.), *Crisis and Change in Contemporary India*, New Delhi, Sage, 1994.
6. C.P. Bhambri, *The Indian State: Fifty Years*, New Delhi, Shipra, 1999.
7. P.R. Brass, *Politics of India Since Independence*, 2nd edn., Cambridge, Cambridge University Press, 1994.
8. P.R. Brass, *Language, Religion and Politics in North India*, London, Cambridge University Press, 1974.
9. N. Chandhoke, *Beyond Secularism: The Rights of Religious Minorities*, Delhi, Oxford University Press, 1999.
10. F.R. Frankel, and et al. (eds.), *Transforming India: Social and Political Dynamics of Democracy*, New Delhi, Oxford University Press, 2000.
11. N.G. Jayal (ed.), *Democracy in India*, Delhi, Oxford University Press, 2001.
12. A.Kaushik, *Democratic Concerns: The Indian Experience*, Jaipur, Alekh, 1994.
13. S.Kaviraj, *Politics in India, Delhi*, Oxford University Press, 1998.
14. A.Kohli, (ed), *The Success of India's Democracy*, Cambridge, Cambridge University Press, 2001.
15. R.Kothari, (ed.), *State and Nation Building*, Bombay, Allied Publishers, 1976.
16. R.Kothari, *Caste and Politics in India*, New Delhi, Orient Longman, 1970.

17. R. Kothari, *Politics in India*, New Delhi, Orient Longman, 1970.
18. R. Kothari, *Party System and Election Studies*, Bombay, Asia Publishing House, 1967.
19. A.Kumar (ed.), *Nation-Building in India: Culture, Power and Society*, New Delhi, Radiant Publishers, 1999.
20. W.H. Morris Jones, *Government and Politics in India*, Delhi, BI Publications, 1974.
21. A.G. Noorani, *Constitutional Questions in India: The President, Parliament and the States*, Delhi, Oxford University Press, 2000.
22. M.V. Pylee, *Constitutional Government in India*, Bombay, Asia Publishing House, 1977.
23. M.V. Pylee, *An Introduction to the Constitution of India*, New Delhi, Vikas, 1998.
24. M.P. Singh and H. Roy (ed.), *Indian Political System: Structure, Policies, Development*, New Delhi, Jnanada Prakashan, 1995..
25. R. Thakur, *The Government & Politics of India*, London, Macmillan, 1995.
26. P. Wallace (ed.), *Region and Nation in India*, Delhi, Oxford University Press, 1985.
27. M. Weiner, *The Indian Paradox: Essays in Indian Politics*, New Delhi, Sage, 1999.
28. Abbas, *Indian Government and Politics*, Pearson, New Delhi, 2012.
29. Neera Chandoke, *Contemporary India*, Pearson, New Delhi, 2012.
30. Pravin Kumar Jha, *Indian Politics in Comparative Perspective*, Pearson, New Delhi, 2012.
31. Pravin Kumar Jha, *Tulnatamak Paripekchay Mein Bhartiya Rajniti*, Pearson, New Delhi, 2012.

Mapping Matrix of Course M POL(C) – 07

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL(C)–07) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(C) – 07

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(C)-07.1	3	3	3	-	-	3	3	3	3	2	2	3
M POL(C)-07.2	3	3	3	-	-	3	3	3	3	2	2	3
M POL(C)-07.3	3	3	3	-	-	3	3	3	3	2	2	3
M POL(C)-07.4	3	3	3	-	-	3	3	3	3	2	2	3
Average	3	3	3	-	-	3	3	3	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL(C)–07) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(C) – 07

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(C)-07.1	3	3	3	3
M POL(C)-07.2	3	3	3	3
M POL(C)-07.3	3	3	3	3
M POL(C)-07.4	3	3	3	3
Average	3	3	3	3

M POL(C) – 08
International Relations-Issues

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the core issues in international politics. It critically explores issues, challenges and themes surrounding global environment, Human Rights, Gender, Nationalism and Ethnicity, International Terrorism, Regionalism & Integration and New International Economic Order, among others.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|--------------|---|
| M POL(C)-8.1 | Understand the changing nature of global order, the emergence of contemporary world order and have in depth knowledge of theories of globalization. |
| M POL(C)-8.2 | Equip themselves to generate their own ideas and ability to critically examine the important issues shaping and posing challenges to the world today. |
| M POL(C)-8.3 | Develop the skill to analyze the political debates related to global environment like nationalism, ethnicity and neo-imperialism. |
| M POL(C)-8.4 | Have well grounded understanding of concepts of Regionalism and Integration and to comparatively analysis of different regional organizations. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

Unit-I Global Order-Cold War, Détente, End of Cold War, Emerging World Order, Theories of Globalization.

Unit-II Environment Politics and Conferences, Issues and Challenges;
Human Rights. Concept, Sources and Problems.
Gender Issues- Theories, Conferences, Impact of Globalization.

Unit-III Nation and Nationalism – Debates and Issues,
Nationalism and Ethnicity.
International Terrorism.
Neo-Imperialism and Politics of MNCs.

Unit-IV Regionalism & Integration.
 Regional Organizations -EU, ASEAN, SAARC.
 New International Economic Order-
 Non Aligned Movement.-Bases, Growth and Relevance

Suggested Readings :

1. John, Baylis and Steve Smith, *Globalization of World Politics*, Oxford, London, 1997.
2. P.Allan and K. Goldman (eds.), *The End of the Cold War*, Dordrecht, Martinus Nijhoff, 1992.
3. S. Burchill et. al., *Theories of International Relations*, Hampshire, Macmillan, 2001.
4. A.A. Coulombis and J.H. Wolf, *Introduction to International Relations: Power and Justice*, New York, Praegar, 1989.
5. K.W. Deutsch, *The Analysis of International Relations*, New Delhi, Prentice Hall, 1989.
6. A.J.R. Groom and M. Lights (eds.), *Contemporary International Relations: A Guide to Theory*, London, Printer, 1993.
7. F. Halliday, *Revolution and World Politics: The Rise and Fall of the Sixth Great Power*, Basingstoke, Macmillan, 1999.
8. F. Halliday, *Rethinking International Relations*, Basingstoke, Macmillan, 1994.
9. S.H. Hoffman, *Essays in Theory and Politics of International Relations*, Boulder Colorado, Westview Press, 1989.
10. R.O. Keohane (ed.), *Neo-realism and Its Critics*, New York, Columbia University Press, 1986.
11. H.J. Morgenthau, *Politics Among Nations*, 6th Edition, revised by K.W., Thompson, New York, Alfred Knopf, 1985.
12. M.S. Rajan, *Non-Alignment and the Non-Alignment Movement in the Present World Order*, Delhi, Konark, 1994.
13. J.N. Rosenau and K. Knorr (eds.), *Contending Approaches to International Politics*, Princeton NJ, Princeton University Press, 1969.
14. A.P. Schmidt and A.J. Jongman (eds.), *Political Terrorism: A New Guide to Actors, Authors, Concepts, Data Bases, Theories and Literature*, 2nd edn., Amsterdam, North Holland Publishing Co., 1988.
15. M.P. Sullivan, *Theories of International Politics: Enduring Paradigm in a Changing World*, Hampshire, Macmillan, 2001.
16. S.P. Verma, *International System and the Third World*, New Delhi, Vikas, 1988.
17. G. Williams, *Third World Political Organizations*, London, Macmillan, 1987.
18. Mahadev Kumar, *Antarrashtriya Rajniti Ke Saidhantik Paksh*, Agra, 1984.
19. Ajay Kumar, *Antarrashtriya Sambandhon Ke Siddhant*, Pearson, New Delhi, 2012.
20. Chimni et al, *International Relations*, Pearson, New Delhi, 2012.
21. Sanju Gupta, *An Introduction to International Relations*, Pearson, New Delhi, 2012.

Mapping Matrix of Course M POL(C) – 08

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL(C)–08) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(C) – 08

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(C)-08.1	3	3	3	-	-	3	2	3	3	2	2	3
M POL(C)-08.2	3	3	3	-	-	3	2	3	3	2	2	3
M POL(C)-08.3	3	3	3	-	-	3	2	3	3	2	2	3
M POL(C)-08.4	3	3	3	-	-	3	2	3	3	2	2	3
Average	3	3	3	-	-	3	2	3	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL(C)–08) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(C) – 08

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(C)-08.1	3	3	3	3
M POL(C)-08.2	3	3	3	3
M POL(C)-08.3	3	3	3	3
M POL(C)-08.4	3	3	3	3
Average	3	3	3	3

M POL(C) – 09
Public Administration-II

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at introducing the students to the core elements of Public Administration as a discipline. It explores concepts and themes like Bureaucracy, Good Governance and Leadership along with issues like Corruption, Transparency and Accountability, among others, that are central to the understanding of Public Administration in India.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|---------------|--|
| M POL(C)-09.1 | Comprehend the basic theories, issues of Bureaucracy and the importance of Personnel Administration. |
| M POL(C)-09.2 | Understand the core elements of Financial Administration. |
| M POL(C)-09.3 | Analyze the concept of good governance and reforms in administration. |
| M POL(C)-09.4 | Understand the role of Leadership, political parties and pressure groups in policy formation. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

Unit-I Bureaucracy- Theories, Types and Roles, Max Weber and his Critics.
Civil Servant - Minister Relationship, Downsizing and Modernization of Bureaucracy.
Personnel Administration-Recruitment, Training, Promotion, Discipline, Morale Employee-Employer Relations.

Unit-II Financial Administration- Budget, Audit.
Control Over Finance with Special Reference to India and U.K.
Development Planning and Administration in India.

Unit-III Good Governance- Problems of Administration, Corruption, Transparency and Accountability.
Administrative Reforms, Right to Information and Crisis Management.

Unit-IV Leadership- Role in Decision-Making, Communication,
Grievance Redressal Institutions- Ombudsman, Lokpal and Lokayukta.
Role of Political Parties, Pressure Groups and Public Opinion in the Process of
Policy Formation.

Suggested Readings

1. J.E. Anderson, *Public Policy Making*, Boston, Houghton, Mifflin, 1990.
2. P.H., Appleby, *Public Administration for a Welfare State*, Bombay, Asia Publishing House, 1961.
3. A. Avasthi and S.N. Maheshwari, *Public Administration*, Agra, Laxmi N. Aggarwal, 1996.
4. P.R. Dubashi, *Recent Trends in Public Administration*, Delhi, Kaveri Books, 1995.
5. E.N. Gladden, *The Essential of Public Administration*, London, Staples Press, 1958.
6. J. La Palombara and M. Weiner (eds.), *Bureaucracy and Political Development*, Princeton NJ, Princeton University Press, 1966.
7. S.R. Maheshwari, *Administrative Theories*, New Delhi, Allied, 1994.
8. F.A. Nigro and L.S. Nigro, *Modern Public Administration*, New York, Harper and Row, 1984.
9. L. Peters, "Downsizing the Civil Service in Developing Countries: Golden Handshake or Smiling Farewells?" *Public Administration and Development*, 18(4), Oct. 1998, pp. 381-86.
10. D.C. Pitt, and B.C. Smith (eds.), *The Computer Revolution: The Impact of Information Technology on Government Brighton*, Wheatsheaf Books, 1984.
11. R. Presthus, *Public Administration*, New York, Ronald, 1975.
12. D. Waldo (ed.), *Ideas and Issues in Public Administration: A Book of Readings*, New York, McGraw Hill, 1953.
13. Hoshier Singh and Pradeep Sachdeva, *Public Administration*, Pearson, New Delhi, 2012.
14. Hoshier Singh and Pradeep Sachdeva, *Lok Prashasan*, Pearson, New Delhi, 2012.

Mapping Matrix of Course M POL(C) – 09

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL(C)–09) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(C) – 09

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(C)-09.1	3	3	3	-	-	3	2	3	3	2	2	3
M POL(C)-09.2	3	3	3	-	-	3	2	3	3	2	2	3
M POL(C)-09.3	3	3	2	-	-	3	2	3	3	2	2	3
M POL(C)-09.4	3	3	3	-	-	3	2	2	3	3	2	3
Average	3	3	2.75	-	-	3	2	2.75	3	2.25	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL(C)–09) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(C) – 09

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(C)-09.1	3	3	3	2
M POL(C)-09.2	2	3	3	2
M POL(C)-09.3	3	3	3	3
M POL(C)-09.4	3	3	3	3
Average	2.75	3	3	2.5

M POL(E) – 10-i
Research Methodology-II

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper intends to enable the students to understand the nature of social research. It prepares the students to identify and formulate research problems and understand the formulation of research designs. The paper also aims at enabling the students to analyze, interpret and present data.

Course Outcomes:

At the end of this course, the students would be able to:

- | | |
|------------------|---|
| M POL (E)-10-i.1 | Identify the research problem and formulation of various types of research designs. |
| M POL (E)-10-i.2 | Understand and explain types of data and methods of data collection. |
| M POL (E)-10-i.3 | Analyse the secondary data and the use of statistics in research work. |
| M POL (E)-10-i.4 | Develop the skill to present data and learn how to write a research report, paper and thesis. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

- | | |
|-----------------|--|
| Unit-I | Identification and Formulation of Problem.
Research Design: Formation, Experimental and Non-Experimental Designs
Sampling-Principles and Methods. |
| Unit-II | Data-Types and Sources, Observation, Questionnaire, Schedule and Interview.
Survey Method- Utility, Application and Limitations. |
| Unit-III | Analysis of Secondary Data-Archival and Library Research, Document Analysis, Using Written Records, Scrutinizing the Evidences, Content Analysis.
Quantification in Social Research: Statistics- Meaning, Purpose and Scope, Statistical Techniques of Data-Analysis. |
| Unit-IV | Presentation of Data- Textual, Graphic and Tabular.
Presentation of Research- Paper Writing, Report Writing and Thesis Writing. |

Suggested Readings

1. H.N. Blalock, *An Introduction to Social Research*, Englewood Cliffs NJ, Prentice Hall, 1970.
2. J. Blondel, *Thinking Politically*, London, Wildwood House, 1976.
3. A. Bryman, *Quantity and Quality in Social Research*, London, Unwin Hyman, 1988.
4. A.F. Chalmers, *Science and Its Fabrication*, Milton Keynes, Open University Press, 1990.
5. J. Galtung, *Theory and Methods of Social Research*, New York, Columbia University Press, 1987.
6. A.Giddens, *Profiles and Critiques in Social Theory*, London Macmillan, 1982.
7. W.J. Goode and P.K. Hatt, *Methods of Social Research*, New York, McGraw Hill, 1952.
8. A.C. Isaak, *Scope and Methods of Political Science*, Homewood Illinois, Dorsey Press, 1985.
9. J.B. Johnson and R.A. Joslyn, *Political Science Research Methods*, Washington DC, C.Q. Press, 1986.
10. F.N. Kerlinger, *Behavioural Research*, New York, Holt, Rinehart and Winston, 1979.
11. T.Kuhn, *The Structure of Scientific Revolution*, Chicago, University of Chicago Press, 1970.
12. R. K. Merton (ed.), *Social Theory and Social Structure*, New York, The Free Press, 1957.
13. D. Miller (ed.), *Pocket Popper*, London, Fontana, 1997.
14. Sir, K.R. Popper, *The Poverty of Historicism*, London, Reoutledge, 1991.
15. P.V. Young, *Scientific Social Surveys and Research*.
16. Robert A. Dahl, *Modern Political Analysis*, Englewood Cliffs, NJ Prentice Hall, 1963.

Mapping Matrix of Course M POL(E) – 10-i

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E)–10-i) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 10-i

CO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
M POL(E)-10-i.1	3	3	3	3	3	3	2	3	3	2	2	3
M POL(E)-10-i.2	3	3	3	3	3	3	2	3	3	2	2	3
M POL(E)-10-i.3	3	3	3	3	3	3	2	3	3	2	2	3
M POL(E)-10-i.4	3	3	3	3	3	3	2	3	3	2	2	3
Average	3	3	3	3	3	3	2	3	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E)–10-i) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 10-i

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-10-i.1	3	3	3	2
M POL(E)-10-i.2	3	3	3	2
M POL(E)-10-i.3	3	3	3	2
M POL(E)-10-i.4	3	3	3	3
Average	3	3	3	2.25

M POL(E) – 10-ii
Geo-Politics and World Affairs

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims to acquaint the students with the scope and importance of Geo-politics. It also explores themes like the Importance of various Geo-political factors, Geo-political significance of various regions and the Geo-political explanation of foreign policy formulation along with other themes central to the study of geo-politics.

Course Outcomes:

After the completion of this course, the students will be able to:

- M POL(E) - 10-ii.1 Have in depth knowledge of the scope and importance of Geo-Politics and role played by geopolitical factors in shaping the Geopolitics..
- M POL(E) - 10-ii.2 Examine the Geo-Political Significance of various regions of world and the Indian Ocean.
- M POL(E) - 10-ii.3 Evaluate the advantages and disadvantages of Land locked States and the economic and political implications of Core and Peripheral states.
- M POL(E) - 10-ii.4 Develop a deeper understanding of the role of ecological factors in the making of foreign policy and various regional and global challenges to the foreign policy formulation

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

Unit-I Scope and Importance of Geo-Politics, Geo-Politics in the Cold War and Post Cold War Era.

Importance of Geo-Political Factors-Physical, Human, Economic, Political and Environmental.

Unit-II Geo-Political Significance of West Asia, South Asia, South-East Asia and Indian Ocean.

Unit-III Land Locked States-Advantages and Disadvantages, Case Studies. Core-Periphery- Economic and Political Implication.

Unit-IV Geo-Political Explanation of Foreign Policy Formulation.
Ecological Determinants.
Regionalist, Internationalist Globalist Challenges and Opportunities.

Suggested Readings

1. Charles C. Colby, ed., *Geographic Aspects of International Relations*.
2. J.P. Cole, *Geography and World Affairs*.
3. W. Gordon East and A.E. Moodie, eds., *The Changing World: Studies in Political Geography*.
4. Pascal Girot and Eleonore Kofman, eds., *International Geopolitical Analysis*.
5. C.S. Gray, *The Geopolitics of the Nuclear Era: Heartland, Rimland and the Technological Revolution*.
6. W.A. ZDouglass Jackson, *Politics and Geographic Relationships*.
7. B.M. Russett, *International Regions and International System*.
8. R. Strausz-Hupe, *Geopolitics*.
9. L.M. Alexander, *World Political Patterns*, Ran McNally, Chicago, 1963.
10. B.L. Sukhwai, *Modern Political Geography*, Sterling Publishers, New Delhi, 1968.
11. Teter Taylor, *Political Geography*, Longmen, London, 1985.
12. N.J. G. Pounds, *Political Geography*, McGraw Hill, New York, 1972.
13. A.E. Moddie, *Geography Behind Politics*, Hutchnison, London, Latest Edition.
14. J.R.V. Prescott, *The Geography of Frontiers and Boundaries Aldine*, Chicago.
15. R.D. Dikshit, *Political Geography: A Contemporary Perspective*, Tata McGraw Hill, New Delhi, 1996.
16. R.D. Dikshit, *Political Geography: A Century of Process*, Sage, New Delhi, 1999.
17. C.D. Deshpande, *India-A Regional Interpretation Northern Book Centre*, New Delhi, 1992.
18. K.M. Panikkar, *Geographical Factors in India History*, 2 Vols, Asia Publishing House Bombay, 1959.

Mapping Matrix of Course M POL (E) – 10-ii

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E)–10-ii) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 10-ii

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-10-ii.1	3	3	3	-	-	3	2	3	3	2	2	3
M POL(E)-10-ii.2	3	3	3	-	-	3	2	3	3	2	2	3
M POL(E)-10-ii.3	3	3	3	-	-	3	2	3	3	2	2	3
M POL(E)-10-ii.4	3	3	3	-	-	3	3	3	3	2	2	3
Average	3	3	3	-	-	3	2.25	3	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E)–10-ii) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 10-ii

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-10-ii.1	2	3	3	2
M POL(E)-10-ii.2	3	3	3	2
M POL(E)-10-ii.3	3	3	3	3
M POL(E)-10-ii.4	3	3	3	3
Average	2.75	3	3	2.25

M POL(E) – 10-iii
Media and Politics

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the role of communication in a democracy. It explores various themes like the Role and Impact of Press on politics in India, Issues and Problems related to mass media in India and Nation Building and Political Development in India, among others.

Course Outcomes:

After the completion of this course, the students will be able to:

- M POL(E)-10-iii.1 Comprehend the theories and role of Political Communication .
- M POL(E)-10-iii.2 Critically evaluate the role and impact of Press in relation to Politics in India.
- M POL(E)-10-iii.3 Meaningfully engage with the idea of Freedom of Press.
- M POL(E)-10-iii.4 Acquire deeper understanding of relation between Mass Media and Nation Building.

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

Unit-I Theories of Political Communication: Concept, Role of Communication in a Democracy; Media as a Means of Socialization

Unit-II Press and Politics in India-Critical Evaluations of Role and Impact
Election Campaigns, Opinion Polls, Exit Polls, Relevance, and Reliability.
Agenda Setting Function of the Media.

Unit-III T.V., Radio and politics in India-Critical Evaluation of role and Impact
Freedom of Media and Right to Information

Unit-IV Mass Media and the Government- Issues and Problems: Government Monopoly; Executive Censorship; Judicial Interpretation; Legislation
Mass Media, Nation Building and Political Development in India.

Suggested Readings

1. Yogesh Atal, *Local Communities and National Politics: A Study in Communication Links and Political Involvement*.
2. B.D. Dhawan, *Development of Television in India*.
3. S.K. Goyal, et al., *Ownership and Control Structure of the Indian Press*.
4. Rebert L. Hardgrave, "Politics and The Film in Tamil Nadu: The Stars and the DMK", *Asian Survey*, March 1973.
5. Indian Institute of Mass Communication, *An Indian Personality for Television: Report of the Working Group on Software for Doordarshan*.
6. Sharad Karkhanis, *Indian Politics and the Role of the Press*.
7. Prayag Meha, *Election Campaign*.
8. Ministry of Information and Broadcasting, Publication Division, Govt. of India, *Mass Media in India*.
9. Claus Mueller, *The Politics of Communication*.
10. Uma Narula and S.S. Yadava, *Portrayal of Election Campaign in Press*.
11. A.G. Noorani, ed., *Freedom of the Press in India*.
12. Thomas E. Patterson, *The Mass Media Election: How Americans Choose their President*.
13. Nicholas Pronay and D.W. Spring, eds., *Propaganda, Politics and Film*.
14. R. Righter, *Whose News? Politics, the Press and the Third World*.
15. Susanne H. Rudolph, "Form Madras: A View of the Southern Film", *Yale Review*, Vol. 60, No. 3, March 1971.
16. B. Rubin, *Media Politics and Democracy*.
17. Aruna Vasudev, *An Outlook for India*

Mapping Matrix of Course M POL (E) – 10-iii

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E)–10-iii) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 10-iii

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-10-iii.1	3	3	3	-	-	3	2	3	3	2	3	3
M POL(E)-10-iii.2	3	3	3	-	-	3	2	3	3	2	3	3
M POL(E)-10-iii.3	3	3	3	-	-	3	2	3	3	2	3	3
M POL(E)-10-iii.4	3	3	3	-	-	3	2	3	3	2	3	3
Average	3	3	3	-	-	3	2	3	3	2	3	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E)–10-iii) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 10-iii

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-10-iii.1	3	3	3	3
M POL(E)-10-iii.2	3	3	3	3
M POL(E)-10-iii.3	3	3	3	3
M POL(E)-10-iii.4	3	3	3	3
Average	3	3	3	3

OESS 05
INDIAN POLITY

Credit: 02

Max. Marks: 50
Time: 2 hours

Objective: The Paper aims to acquaint the students about the basic features of Indian Constitution along with its institutional arrangements.

Course Outcomes

After the completion of this course, the students will be able to:

- OESS-05.1 Understand the basic features of Indian Constitution.
- OESS-05.2 Comprehend the functioning of Union Legislature and Executive.
- OESS-05.3 Develop a deeper understanding of Executive and Legislature at state level.
- OESS-05.4 Understand the functioning of Indian Judiciary.

Note: The question paper will consist of eight questions. The candidate shall attempt four questions in all. Each question carries equal marks.

Unit-1: Constitutional Foundations: Basic Features of the Indian Constitution, Preamble, Fundamental Rights, Directive Principles of State Policy.

Unit-2: Union Executive and Legislature: President, Prime Minister, Council of Ministers, Parliament.

Unit -3: State Executive and Legislature: Governor, Chief Minister, State Legislature.

Unit- 4: Judiciary: Supreme Court, High Courts, Judicial Review, judicial Activism.

Readings:

1. G. Austin, The Indian Constitution Cornerstone of a Nation, OLIP, Oxford, 1966
2. S. Kaviraj, Politics in India, OUP, Delhi, 1998
3. A. Kholi, (ed.), The Success of India's Democracy, Cambridge University Press, Cambridge, 2001
4. R. Kothari, Politics in India, Orient Longman, New Delhi, 1970
5. WH Morris Jones, Government and Politics in India, BI Publications, Delhi, 1974
6. Neera Chandoke, Contemporary India, Pearson, New Delhi, 2012
7. PR Brass, Politics of India since Independence, Cambridge University Press, Cambridge, 1994.
8. M V Pylee, An Introduction to the Constitution of India, Vikas Publications, New Delhi, 1998.
9. B. Chakrabarty & R K Pandey, Indian Government and Politics, Sage, New Delhi, 2008.
10. MP Singh & R. Saxena, Indian Politics: Constitutional Foundations and Institutional Functioning, PHI, New Delhi, 2011.

Mapping Matrix of Course OESS – 05

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (OESS–05) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course OESS– 05

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
OESS-05.1	3	3	3	-	-	3	3	3	3	2	2	3
OESS-05.2	3	3	3	-	-	3	3	3	3	2	2	3
OESS-05.3	3	3	3	-	-	3	3	3	3	2	2	3
OESS-05.4	3	3	3	-	-	3	3	3	3	2	2	3
Average	3	3	3	-	-	3	3	3	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (OESS–05) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course OESS – 05

CO	PSO 1	PSO 2	PSO 3	PSO 4
OESS-05.1	3	3	3	2
OESS-05.2	3	3	3	2
OESS-05.3	3	3	3	2
OESS-05.4	3	3	3	2
Average	3	3	3	2

Semester-III

M POL(C) – 11 Political Theory-I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims to acquaint the students with the core elements of Political Theory. It explores themes like Meaning, Nature and Significance of Political Theory, Behavioural and Post-behavioural movements while tracing the trajectory of the decline and resurgence of Political Theory. The paper also has sections exploring the writings and ideas of theorists like Marcuse, Habermass, Hayek, Nozik, Oakshott, and Arendt.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|-----------------|---|
| M POL(C) – 11.1 | Understand the meaning and significance of Political Theory and interpretations of the classical tradition. |
| M POL(C) – 11.2 | Develop a deep understanding of Behavioural and Post Behavioural movements. |
| M POL(C) – 11.3 | Comprehend various perspectives in Critical theory |
| M POL(C) – 11.4 | Analyse the ideas of Micheal Oakshott and Hannah Arendt. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

UNIT-I Meaning, Nature, Concerns and Significance of Political Theory; Different Interpretations of Political Theory. Importance and Limitations of Classical Tradition.

UNIT-II Behaviouralism and Post Behaviouralism. Decline of Political Theory; Resurgence of Political Theory.

UNIT-III Critical Theory: Herbert Marcuse, Jurgen Habermass, Libertarianism: Hayek and Nozick.

UNIT-IV Rationalism & Limits of Politics: Michael Oakshott; Importance of Politics and Power: Hannah Arendt.

Suggested Readings

1. D.Bell, *The End of Ideology*, New York, The Free Press, 1960.
2. A.Cobban, 'The Decline of Political Theory,' *Political Science Quarterly*, 1953, LXVIII, pp. 321-337.
3. D. Easton, The future of the postbehavioural phase in political science, in *Contemporary Empirical Political Theory*, K. R. Monroe (ed.), Berkeley, University of California Press, 1997.
4. F. Fukuyama, *The End of History and the last Man*, Harmondsworth, Penguins, 1992.
5. R. E. Goodin and H.D. Klingemann (eds.), *A New Handbook of Political Science*, Oxford, Oxford University Press, 1996.
6. D. Held, *Political Theory Today*, Cambridge, Polity Press, 1991.
7. W. Kymlicka, *Contemporary Political Philosophy : An Introduction*, Oxford, The Clarendon Press, 1990.
8. S. Mulhall and A. Swift, *Liberals and Communitarians*, Oxford, Basil Blackwell, 1992.
9. R. Plant, *Modern Political Thought*, Oxford, Blackwell, 1991.
10. G.H. Sabine, What is Political Theory?, *Journal of Politics*, 1939, 1(1).
11. R. J. Bernstein (ed.), *Habermas and Modernity*, Cambridge, Polity Press, 1985.
12. R. Grant, *Oakeshott*, London, Claridge Press, 1990.
13. L. Hutcheon, *The Politics of Postmodernism*, London and New York, Routledge, 1989.
14. S. K. White, *Political Theory and Postmodernism*, Cambridge, Cambridge University Press, 1991.

Mapping Matrix of Course M POL(C) – 11

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL(C)–11) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(C) – 11

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(C)-11.1	3	3	3	-	-	3	2	3	3	2	2	3
M POL(C)-11.2	3	3	3	-	-	3	2	3	3	2	2	3
M POL(C)-11.3	3	3	3	-	-	3	2	3	3	2	2	3
M POL(C)-11.4	3	3	3	-	-	3	2	3	3	2	2	3
Average	3	3	3	-	-	3	2	3	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL(C)–11) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(C) – 11

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(C)-11.1	3	3	3	3
M POL(C)-11.2	3	3	3	2
M POL(C)-11.3	3	3	3	3
M POL(C)-11.4	3	3	3	2
Average	3	3	3	2.5

M POL(C) – 12
Comparative Politics-I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims to acquaint the students with the Meaning, Nature and Scope of Comparative Politics and enable them make a comparative analysis of various political systems. It explores various approaches to the study of Comparative Politics along with themes like Constitutionalism, Forms of Government, Liberal-democratic and Authoritarian political systems, among others.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|---------------|---|
| M POL(C)-12.1 | Comprehend the meaning and evolution of Comparative Politics along with various traditional approaches to study the same. |
| M POL(C)-12.2 | Learn to use modern approaches to compare various political systems. |
| M POL(C)-12.3 | Develop an understanding of the concept of constitutionalism along with various forms of government. |
| M POL(C)-12.4 | Compare and assess different organs of the government and types of political systems |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

- | | |
|-----------------|---|
| UNIT-I | Comparative Politics: Meaning, Nature & Scope; Evolution of Comparative Politics as a Separate Discipline. Approaches to the Study of Comparative Politics: Traditional Approaches: Philosophical, Historical, Legal – Institutional. |
| UNIT-II | Modern Approaches: Systems Analysis; Structural-Functionalism; Political Culture, Political Socialization, Political Development, Political Modernization, Political Communication, Political Participation. |
| UNIT-III | Constitutionalism: Concept, History of Constitutionalism and Problems, Forms of Government: Unitary & Federal, Presidential & Parliamentary. |
| UNIT-IV | Liberal Democratic & Authoritarian Political Systems; Organs of Government: Executive, Legislature & Judiciary – their relationship in Comparative Perspective. |

Suggested Readings

1. G.A. Almond and J.S. Coleman, *The Politics of the Developing Areas*, Princeton NJ, Princeton University Press, 1960.
2. G.A. Almond, and S. Verba, *The Civic Culture : Political Attitudes and Democracy in Five Nations*, Princeton NJ, Princeton University Press, 1963.
3. G.A. Almond, *Comparative Politics Today : A World View*, 7th edn., New York, London, Harper/Collins, 2000.
4. D.E. Apter, *The Politics of Modernization*, Chicago, University of Chicago Press, 1965.
5. A.Bebler and J. Seroka (eds.), *Contemporary Political Systems: Classifications and Typologies*, Boulder Colorado, Lynne Reinner Publishers, 1990.
6. L.J.Cantori and A.H. Zeigler (ed.), *Comparative Politics in the Post-Behaviouralist Era*, London, Lynne Reinner Publisher, 1988.
7. O. Dunleavy and B.O' Leary, *Theories of Liberal Democratic State*, London, Macmillan, 1987.
8. R. Hauge and M. Harrop, *Comparative Government and Politics. An Introduction*, 5th edn., New York, Palgrave, 2001.
9. H. Finer, *Theory and Practice of Modern Government*, London, Methuen, 1969.
10. J.C. Johari, *Comparative Political Theory: New Dimensions, Basic Concepts and Major Trends*, New Delhi, Sterling, 1987.
11. K. Kumar, *Revolution : The Theory and Practice of a European Idea*, London, Weidenfeld and Nicolson, 1971.
12. R.C. Macridis, *The Study of Comparative Government*, New York, Doubleday, 1955.
13. R.C. Macridis and R.E. Ward, *Modern Political Systems : Europe, and Asia*, 2nd edn. Englewood Cliffs NJ, Prentice Hall, 1968.
14. J. Manor (ed.), *Rethinking Third World Politics*, London, Longman, 1991.
15. R.C. Macridis, *Modern European Governments: Cases in Comparative Policy - Making*, Englewood Cliffs NJ, Prentice Hall, 1968.
16. L.W. Pey (ed.), *Communication and Political Development*, Princeton NJ, Princeton University Press, 1963.
17. R.I. Rotberg (ed.), *Politics and Political Change : A Journal of Inter-Disciplinary History Reader*, Massachusetts, MIT Press, 2001.
18. H.J. Wiarda (ed.), *New Developments in Comparative Politics*, Boulder Colorado, Westview Press, 1986.
19. Prabir De, *Comparative Politics*, Pearson, New Delhi, 2012.

Mapping Matrix of Course M POL(C) – 12

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL(C)–12) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(C) – 12

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(C)-12.1	3	3	3	-	-	3	3	3	3	2	2	3
M POL(C)-12.2	3	3	3	-	-	3	3	3	3	2	2	3
M POL(C)-12.3	3	3	3	-	-	3	3	3	3	2	2	3
M POL(C)-12.4	3	3	3	-	-	3	3	3	3	2	2	3
Average	3	3	3	-	-	3	3	3	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL(C)–12) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(C) – 12

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(C)-12.1	3	3	3	2
M POL(C)-12.2	3	3	3	2
M POL(C)-12.3	3	3	3	3
M POL(C)-12.4	3	3	3	3
Average	3	3	3	2.5

Group-A: M POL(E) – 13-i
India's Foreign Policy & Relations-I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the core elements of India's Foreign Policy and its relations vis-a vis other states. It explores themes like the History, Principles and Objectives of India's Foreign Policy, Structure and Process of India's Foreign Policy Making and India's Relations with major countries and India's Foreign Economic Policy, among others.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|------------------|--|
| M POL (E)-13-i.1 | Possess the knowledge of historical development, principles and objectives of India's foreign policy and how it is shaped by domestic and external factors. |
| M POL (E)-13-i.2 | Explore the different institutions involved in the making of foreign policy of India and also to comprehend the intricacies of making of India's foreign policy. |
| M POL (E)-13-i.3 | Assess the changes and continuities in foreign policy of India with major powers of world. |
| M POL (E)-13-i.4 | Examine the economic dimension of foreign policy of India and critically analyze the monetary sources of economic growth from other countries. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

UNIT-I Meaning of Foreign Policy: History, Principles and Objectives of India's Foreign Policy; Domestic and External Determinants.

UNIT-II Structure and Process of Foreign Policy Making-Role of Cabinet and National Security Council, Ministry of External Affairs, Parliament and Intelligence Agencies.

UNIT-III India's Relations with Major Countries: - USA, USSR/Russia, Britain, Japan and Australia.

UNIT-IV India's Foreign Economic Policy-Determinants, Impact of Globalization, Foreign Direct Investments, Foreign Aid and Foreign Trade

Suggested Readings

1. R.S. Yadav, *Bharat Ki Videsh Niti* (in Hindi), Pearson, New Delhi, 2012.
2. R.S. Yadav & Suresh Dhanda, eds., *India's Foreign Policy: Contemporary Trends*, New Delhi, Shipra, 2009.
3. R.S. Yadav (ed.), *India's Foreign Policy Towards 2000 A.D.*, New Delhi, Deep & Deep, 1993.
4. J.N. Dixit, *Across Border: Fifty Years of India's Foreign Policy*, New Delhi, 1999.
5. J. Bandhopahdyaya, *The Making of India's Foreign Policy*, Calcutta, Allied, 1979.
6. V.P. Dutt, *India's Foreign Policy in a Changing World*, New Delhi, Vikas, 1999.
7. N.K. Jha (ed.), *India's Foreign Policy in a Changing World*, New Delhi, South Asian Publishers, 2000.
8. H. Kapur, *India's Foreign Policy : 1947-1993*, New Delhi, Sage, 1994.
9. N. Jetley, *India's Foreign Policy : Challenges and Prospects*, New Delhi, Janaki Prakashan, 1985.
10. S. Mansingh (ed.), *India's Foreign Policy in the 21st Century*, New Delhi, Foreign Policy Institute, 1999.
11. R. Thakur, *Politics and Economics of India's Foreign Policy*, Delhi, Oxford University Press, 1993.
12. C. Raja Mohan, *Crossing The Rubicon: The Shaping of India's New Foreign Policy*, New Delhi, Viking, 2003.
13. N.S. Sisodia & C. Uday Bhaskar, eds., *Emerging India: Security and Foreign Policy Perspective*, New Delhi, Promilla, 2007.
14. Rajen Harshe & K.M. Seethi, eds., *Engaging with the World: Critical Reflections on India's Foreign Policy*, New Delhi, Orientlongman, 2005.
15. Anand Mathur & Sohanlal Meena, eds., *India Profile in Polycentric World Order*, Jaipur, RBSA, 2008.
16. Annpurna Nantiyal, ed., *Challenges to India's Foreign Policy in the New Era*, New Delhi, 2006.
17. Atish Sinha & Madhup Mahota, eds., *Indian Foreign Policy: Challenges and Opportunities*, New Delhi, Academic, 2007.
18. Jayanta Kumar Roy, *India's Foreign Relations, 1947-2007*, Routledge, New Delhi, 2011.
19. Dilip H. Mohite and Amit Dholakia, eds, *India and The Emerging World Ordre*, Kalinga, New Delhi, 2001.
20. Anjali Ghosh & others, *India's Foreign Policy*, Pearson, New Delhi, 2012.

Mapping Matrix of Course M POL (E) – 13-i

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E)–13-i) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 13-i

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-13-i.1	3	3	3	-	-	3	2	3	3	2	2	3
M POL(E)-13-i.2	3	3	3	-	-	3	2	3	3	2	2	3
M POL(E)-13-i.3	3	3	3	-	-	3	2	3	3	2	2	3
M POL(E)-13-i.4	3	3	3	-	-	3	2	3	3	2	2	3
Average	3	3	3	-	-	3	2	3	3	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E)–13-i) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 13-i

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-13-i.1	3	3	3	2
M POL(E)-13-i.2	2	3	3	3
M POL(E)-13-i.3	3	3	3	3
M POL(E)-13-i.4	3	3	3	3
Average	2.75	3	3	2.75

Group-A: M POL(E) – 14-ii
International Law-I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the nature, scope and basis of International Law. It explores themes like Relationship between International Law and Municipal Law, Codification and Subjects of International Law, among others. The paper also has sections on Jurisdiction over Aliens and State Jurisdiction over land, air and water.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|-------------------|---|
| M POL (E)-14-ii.1 | Grasp the basis and sources of International law and its relationship with Municipal law. |
| M POL (E)-14-ii.2 | Develop a thorough understanding of concepts and subjects of International law |
| M POL (E)-14-ii.3 | Understand the jurisdiction of state over citizens, aliens and diplomats. |
| M POL (E)-14-ii.4 | Understand the jurisdiction of states over land, air and water, besides the mode of acquiring and losing the state territory. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

UNIT-I Nature, Scope and Basis of International Law; Sources of International Law.
Relationship between International Law and Municipal Law.

UNIT-II Codification, Subjects of International Law.
Recognition; State Succession; Intervention and Treaties.

UNIT-III Jurisdiction over Aliens; Nationality; Extradition and Diplomatic Privileges and Immunities.

UNIT-IV State Territory and Jurisdiction over Land, Air and Water; Modes of Acquiring and Losing State Territory.

Suggested Readings

1. Brownline, Principles of Public International Law, Oxford, Clarendon Press, 1973, Second Edition.
2. C.G. Fenwick, International Law, Bombay, Vakils, 1971.
3. J.G. Starke, An Introduction to International Law, London, Butterworths, 1972.
4. P.E. Corbett, Law and Diplomacy, Princeton NJ, Princeton University Press, 1959.
5. K. Deutsc and S. Hoffman (ed.), The Relevance of International Law, Oxford, Clarendon Press, 1955.
6. L. Duguit, Law in the Modern State, New York, B.W. Huebsch, 1919.
7. W. Friedmann, The Changing Structure of International Law, New York, Columbia University Press, 1964.
8. H. Kelsen, Principles of International Law, New York, Rinehart and Co., 1952.
9. J. Mattern, Concepts of State, Sovereignty and International Law, Baltimore, Johns Hopkins Press, 1928.
10. L. Oppenheimer, International Law Vol. 1, 1969, Revised edn., Vol II, 1953.
11. J. Stone, Legal Controls of International Conflict, New York, Rinehart and Company, 1954.
12. C. de Visscher, Theory and Reality in Public International Law, Princeton NJ, Princeton University Press, 1957.
13. Sir J.F. Williams, Aspects of Modern International Law, New York, Oxford University Press, 1939.

Mapping Matrix of Course M POL (E) – 14-ii

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E)–14-ii) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 14-ii

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-14-ii.1	3	3	3	-	-	3	2	3	2	2	2	3
M POL(E)-14-ii.2	3	3	2	-	-	3	2	3	2	2	2	3
M POL(E)-14-ii.3	3	3	2	-	-	3	2	3	2	2	2	3
M POL(E)-14-ii.4	3	3	3	-	-	3	2	3	2	2	2	3
Average	3	3	2.5	-	-	3	2	3	2	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E)–14-ii) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 14-ii

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-14-ii.1	3	3	3	2
M POL(E)-14-ii.2	3	3	3	3
M POL(E)-14-ii.3	3	3	3	3
M POL(E)-14-ii.4	3	3	3	3
Average	3	3	3	2.75

Group-A: M POL(E) – 15-iii
International Organization and Global Order Studies-I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the historical evolution of international organization. It also explores the origin of the United Nations, its organs and its changing nature in the post cold war era. The paper also has sections on disarmament and international organization and global problems, among others.

Course Outcomes:

After the completion of this course, the students will be able to:

- M POL(E)-15-iii.1 Comprehend the historical evolution of International Organization and draw a comparison between the League and the UN .
- M POL(E)-15-iii.2 Develop an understanding of the structure and function of organs of the United Nations.
- M POL(E)-15-iii.3 Understand the changing nature and democratization of United Nations in post cold war era.
- M POL(E)-15-iii.4 Understand the role of United Nations in settlement of disputes and international cooperation.

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

UNIT-I Historical Evolution of International Organization: Concert of Europe, Hague Systems, Public International Unions, Genesis of League. Origin of the United Nations: Nature and Principles; Comparison between League and UN systems.

UNIT-II Organs of the United Nations: General Assembly, Security Council, Economic & Social Council, Trusteeship, International Court of Justice, Secretariat; Role of Secretary General.

UNIT-III Disarmament; Changing Nature of UN in the Post-Cold War Era; Democratization of UN System and India's Claim for Permanent Seat in Security Council.

UNIT-IV International Organization and Global Political Problems: Pacific and Coercive Methods for the Settlement of Disputes, (Ch.VI&VII), Promotion of International Cooperation and Non-Political Agencies, Role of Special Agencies of the UN; United Nations and Socio-Economic Development.

Suggested Readings

1. Richard K. Ashley, "The Eye of Power : The Politics of World Modelling," International Organization, Vol. 37, No. 3, 1983.
2. Inis Claude, Changing United Nations, New York, Random House, 1967.
3. Inis Claude, Swords into ploughshares : The Problems and Progress of International organisations, New York, Random House, 1971.
4. S.J.R. Bilgrami, International Organisation, New Delhi, Vikas, 1971.
5. E. Laurd, A History of the United Nations, London, Macmillan, 1989.
6. R.C. Angell, The Quest for World Order, Ann Arbor, University of Michigan Press, 1979.
7. A.L. Bennett, International Organizations : Principles and Issues, Englewood Cliffs NJ, Prentice Hall, 1977.
8. H.G. Nicholas, The UN as a Political Institution, Oxford, Oxford University Press, 1975.
9. W.H. Lewis (ed.), The Security Role of the United Nations, New York, Praegar, 1991.
10. Ronald Meltzer, "Restructuring the UN System, Institutional Reform, Efforts in the Context of North-South Relations," International Organization, vol. 32, No. 4, 1978.
11. Ronald Yalem, "Conflicting Approaches to World Order," Alternatives, Vol. 5, 1979-1980.
12. P. Baehr and L. Gordenker, The United Nations in the 1990s, London, Oxford University Press, 1992.
13. Rikhey, Strengthening UN Peace keeping, London, Hurst and Co., 1993.
14. K. P. Saxena, Reforming the United Nations : The Challenge and Relevance, New Delhi, Sage, 1993.

Mapping Matrix of Course M POL (E) – 15-iii

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E)–15-iii) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 15-iii

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-15-iii.1	3	3	3	-	-	3	2	2	2	2	2	3
M POL(E)-15-iii.2	3	3	2	-	-	3	2	2	2	2	2	3
M POL(E)-15-iii.3	3	3	3	-	-	3	2	2	2	2	2	3
M POL(E)-15-iii.4	3	3	3	-	-	3	2	2	2	2	2	3
Average	3	3	2.75	-	-	3	2	2	2	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E)–15-iii) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 15-iii

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-15-iii.1	2	3	3	3
M POL(E)-15-iii.2	2	3	3	2
M POL(E)-15-iii.3	3	3	3	3
M POL(E)-15-iii.4	3	3	3	2
Average	2.5	3	3	2.5

Group-B: M POL (E) – 13-i
Political Sociology: The Indian Context-I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the meaning, nature and scope of Political Sociology. It explores the major approaches to the study of Political Sociology. It also has sections on Social Framework and Political System in India, Interaction between Society and Polity and Social Asymmetries and Politics in India.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|------------------|---|
| M POL(E) –13-i.1 | Understand the historical evolution of Political Sociology and its major approaches. |
| M POL(E)– 13-i.2 | Critically analyse the social framework in relation to political system in India. |
| M POL(E) –13-i.3 | Understand the interaction between Society & Polity |
| M POL(E) –13-i.4 | Develop a deeper understanding of social asymmetries and their impact on politics in India. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

UNIT-I Meaning, Nature and Scope of Political Sociology, Historical Sociology – Weber, Evolution and Development of Political Sociology.

Major Approaches to the Study of Political Sociology: Systems, Structural Functional, Behavioural & Conflict Approach.

UNIT-II The Social Framework and the Political System in India: Political Influence, Power, Authority and Bureaucracy, Legitimacy, Masses and Elite.

UNIT-III Interaction between Society & Polity: Political Recruitment, Political Communication, Socio-Economic Bases of Community Power Structure & Political Participation.

UNIT-IV Social Asymmetries and Politics in India: Social Stratification – Theory and Practice with Special Reference to Caste and Class, Equality and Inequality Debate.

Suggested Readings

1. G.A. Almond and S. Verba, *The Civic Culture*, Princeton NJ, Princeton University Press, 1963.
2. S. Bayly, *Caste, Society and Politics in India from the Eighteenth Century to the Modern Age*, Cambridge, Cambridge University Press, 1999.
3. R. Bendix, and S.M. Lipset, *Class, Status and Power*, 2nd edn., New York, The Free Press, 1966.
4. P.R. Brass, *Caste, Faction and Party in Indian Politics*, Vols. 2, Delhi, Chankya Publication, 1984-85.
5. P.R. Brass, *Ethnicity and Nationalism: Theory and Comparison*, New Delhi, Sage, 1991.
6. R.E. Dawson and K. Prewitt, *Political Socialization*, Boston, Little Brown, 1969.
7. A.R. Desai, *State and Society in India: Essays in Dissent*, Bombay, Popular, 1974.
8. M. Galanter, *Competing Equalities : Law and the Backward Classes in India*, Berkley, University of California Press, 1983.
9. M. Janowitz, *Political Conflict: Essays in Political Sociology*, New York, New Viewpoints, Watts, 1970.
10. R. Kothari, *Caste and Politics in India*, New Delhi, Orient Longman, 1970.
11. R. Kothari, *Politics in India*, New Delhi, Orient Longman, 1970.
12. R. Kothari, *Democratic Polity and Social Change in India*, Delhi, Allied, 1976.
13. A.Kumar (ed.), *National-Building in India: Culture, Power and Society*, New Delhi, Radiant Publishers, 1999.
14. L.Milbrath, *Political Participation*, Skokie Illinois, Rand-McNally, 1965.
15. T.K. Oomen, *Protest and Change: Studies in Social Movements*, New Delhi, Sage, 1990.
16. D. Sheth, "Caste and Class : Social Reality and Political Representation" in V.A. Pai Panadikar and A. Nandy (eds.), *Contemporary India*, Delhi, Tata McGraw Hill, 1999.

Mapping Matrix of Course M POL (E) – 13-i

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E)–13-i) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 13-i

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-13-i.1	3	3	3	-	-	3	3	2	2	2	2	3
M POL(E)-13-i.2	3	3	3	-	-	3	3	2	2	2	2	3
M POL(E)-13-i.3	3	3	3	-	-	3	3	2	2	2	2	3
M POL(E)-13-i.4	3	3	3	-	-	3	3	2	2	2	2	3
Average	3	3	3	-	-	3	3	2	2	2	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E)–13-i) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 13-i

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-13-i.1	3	3	3	2
M POL(E)-13-i.2	3	3	3	3
M POL(E)-13-i.3	3	3	3	3
M POL(E)-13-i.4	3	3	3	2
Average	3	3	3	2.5

Group-B: M POL(E) – 15-ii
State Politics in India (with special reference to Haryana) -I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the nature of State Politics in India. The paper explores the theoretical framework along with the significance of the study of State Politics. Other themes included in the paper include the theory and practice of federalism in India, Demand for Separate States and Secessionist Movements in India, among others.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|------------------|--|
| M POL(E)-14-ii.1 | Understand the theoretical framework, significance and patterns of State Politics. |
| M POL(E)-14-ii.2 | Analyze the determinants of State Politics and develop an understanding of linguistic Reorganization of States in India. |
| M POL(E)-14-ii.3 | Comprehend the theory and practice of Federalism in India. |
| M POL(E)-14-ii.4 | Understand the politics of Secessionism, demand for separate states and the problem of Naxalism in India. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

- | | |
|-----------------|--|
| UNIT-I | Theoretical Framework for the Study of State Politics.

Significance of the Study of State Politics, Patterns of State Politics. |
| UNIT-II | Determinants of State Politics, Linguistic Reorganization of States in India. |
| UNIT-III | Federalism in India: Theory & Practice, Centre-State Legislative, Administrative & Financial Relations. |
| UNIT-IV | Demands for Separate States in India, Secessionist Movements in India-
Punjab, Jammu & Kashmir and the North- East, Problem of Naxalism in Indian States. |

Suggested Readings

1. G. Austin, *The Indian Constitution: Corner Stone of a Nation*, Oxford, Oxford University Press, 1966.
2. A.Chanda, *Federalism in India: A Study of Union-State Relations*, London, George Allen & Unwin, 1965.
3. P.Chatterjee (ed.), *States and Politics in India*, Delhi, Oxford University Press, 1997.
4. A.Kohli (ed.), *India's Democracy: An Analysis of Changing State - Society Relations*, Princeton, Princeton University Press, 1988.
5. A.Kohli, *Democracy and Discontent: India's Growing Crisis of Governability*, Cambridge, Cambridge University Press, 1991.
6. R. Kothari, *Politics in India*, New Delhi, Orient Longman, 1970.
7. I.Narain (ed.), *State Politics in India*, Meerut, Meenakshi Parkashan, 1967.
8. S. Pai, *State Politics: New Dimensions : Party System, Liberalization and Politics of Identity*, Delhi, 2000.
9. S.C. Mittal, *Haryana: A Historical Perspective*, New Delhi, Atlantic Publishers, 1986.
10. P.D. Sharma, *Legislative Elite in India : A Study in Political, Socialization*, Kurukshetra, Vishal, 1984.
11. Harinder K. Chhabra, *State Politics in India*, Delhi, Surjeet Publications, 1980.
12. B.L. Fadia, *State Politics in India, Vol I & II*, New Delhi, Radiant Publishes, 1984.
13. O.P. Goel, *Caste and Voting Behaviour*, New Delhi, Ritu Publishers, 1981.
14. Subhash C. Kashyap, *The Politics of Defection - A Study of State Politics in India*, Delhi, National Publishing House, 1969.
15. T.R. Sharma (ed.), *New Challenges of Politics in Indian States*, New Delhi, Uppal Publishing House, 1985.
16. P. Choudhary, *The Veiled Women: Shifting Gender Equations in Rural Haryana 1880-1990*, Delhi, Oxford University Press, 1994.
17. Other Readings: *Journal of Haryana Studies*, Kurukshetra University Research Journal of Arts and Humanities.

Mapping Matrix of Course M POL (E) – 15-ii

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E)–15-ii) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 15-ii

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-15-ii.1	3	3	3	-	-	3	2	2	2	3	2	3
M POL(E)-15-ii.2	3	3	3	-	-	3	2	2	2	3	2	3
M POL(E)-15-ii.3	3	3	3	-	-	3	2	2	2	3	2	3
M POL(E)-15-ii.4	3	3	3	-	-	3	2	2	2	3	2	3
Average	3	3	3	-	-	3	2	2	2	3	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E)–15-ii) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 15-ii

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-15-ii.1	3	3	3	3
M POL(E)-15-ii.2	3	3	3	3
M POL(E)-15-ii.3	3	3	3	3
M POL(E)-15-ii.4	3	3	3	3
Average	3	3	3	3

Group-B: M POL(E) – 15-iii
Democracy in India-I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the Concept, Nature and Structure of Democracy in India. The paper explores various theories of democracy along with themes like the resilience of democracy in India, electoral politics in India, interest and pressure groups in India, among others.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|-------------------|---|
| M POL(E)-15-iii.1 | Understand the structure of Indian Democracy with the help of different democratic theories and democratic thinking in India before and after independence. |
| M POL(E)-15-iii.2 | Comprehend the specificity of the electoral process in India, electoral reforms, electoral politics and voting behavior. |
| M POL(E)-15-iii.3 | Understand the role of political parties in Indian democracy and alignment and re-alignment among them. |
| M POL(E)-15-iii.4 | Understand the role of pressure groups, factionalism and defections in Indian Politics. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

UNIT-I Concept, Nature and Structure of Indian Democracy; Theories of Democracy: classical, Elitist, Pluralist and Marxist.

Resilience of Democracy in India: Democratic Thinking and Tradition in Ancient India; Democratic Thinking in Indian Independence Movement and After Independence.

UNIT-II Election Commission, Electoral Process, Defects and Reforms of Electoral Process: V.M. Tarkunde, Dinesh Goswami and Inderjeet Gupta Reports, Electoral Politics and Determinants of Voting Behaviour.

UNIT-III Political Parties: Evolution, Bases, Nature and Classification of Political Parties. Their role in Democracy, Alignment and Realignment among Political Parties in India.

UNIT-IV Interest & Pressure Groups in India; Kinds and Techniques of Pressure groups: Factions and Factional Politics, Politics of Defections and Anti-Defection Law.

Suggested Readings

1. G. Austin, Working a Democratic Constitution : The Indian Experience, Delhi, Oxford University Press, 2000.
2. P. Brass, The Politics of India Since Independence, 2nd edn., Cambridge, Cambridge University Press, 1994.
3. P. Chatterjee (ed.), States and Politics in India, Delhi, Oxford University Press, 1997.
4. F. Frankel, India's Political Economy, 1947-77 : The Gradual Revolution. Princeton NJ, Princeton University Press, 1978.
5. A.H. Hanson and J. Douglas, India's Democracy, New Delhi, Vikas, 1972.
6. N. Jayal, Democracy and the State : Welfare, Secularism and Development in Contemporary India, Delhi, Oxford University Press, 1999.
7. N. Jayal (ed.), Democracy in India, Delhi, Oxford University Press, 2001.
8. Kohli, Democracy and Discontent : India's Growing Crisis of Governability, Cambridge, Cambridge University Press, 1990.
9. Kohil (ed.), India' Democracy : An Analysis of Changing State- Society Relations, Princeton NJ, Princeton University Press, 1988.
10. Kohli (ed.), The Success of India's Democracy, Cambridge, Cambridge University Press, 2001.
11. R. Kothari, Politics in India, Delhi, Orient Longman, 1970.
12. R. Kothari, Democratic Polity and Social change in India, Delhi, Allied, 1976
13. R. Kothari, State Against Democracy : In Search for Humane Governance, Delhi, Ajanta, 1988.
14. W. H. Morris-Jones, Politics Mainly Indian, Delhi, Orient Longman, 1978.
15. D. Sheth, "Caste and class : social reality and political representations" in V.A. Pai Panandikar and A. Nandy (eds.), Contemporary India, Delhi, Tata MacGraw-Hil, 1999.
16. M.N. Srinivas, Social Change in Modern India, Bombay, Allied Publishers, 1966.
17. Varshney (ed.), The Indian Paradox: Essays in Indian Politics, New Delhi, Sage, 1989.
18. J. Sachs, A. Varshney and N. Bajpai (eds.), India in the Era of Economic Reforms, Oxford, Oxford University Press, 1999.

19. Neera Chandoke, Contemporary India, Pearson, New Delhi, 2011.
20. Parvin Kumar Jha, Tulnatamak Paripekchay mein Bhartiya Rajniti, Pearson, New Delhi, 2011.
21. Nawab Singh Sombanshy, Bharatiya Samvidhan ek Samagra Avlokan, Pearson, New Delhi, 2011.

Mapping Matrix of Course M POL (E) – 15-iii

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E)–15-iii) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL(E) – 15-iii

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-15-iii.1	3	3	3	-	-	3	2	2	3	3	2	3
M POL(E)-15-iii.2	3	3	3	-	-	3	2	2	3	2	2	3
M POL(E)-15-iii.3	3	3	3	-	-	3	2	2	3	2	2	3
M POL(E)-15-iii.4	3	3	3	-	-	3	2	2	3	3	2	3
Average	3	3	3	-	-	3	2	2	3	2.5	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E)–15-iii) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 15-iii

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-15-iii.1	3	3	3	2
M POL(E)-15-iii.2	2	3	3	3
M POL(E)-15-iii.3	2	3	3	3
M POL(E)-15-iii.4	3	3	3	3
Average	2.5	3	3	2.75

Group-C: M POL (E) – 13-i
Government & Politics of USA-I

Credit: 04

Max. Marks: 100
Internal Marks: 20
External Marks: 80
Time: 3 Hours

Objective: The paper aims at acquainting the students with the government and politics of USA. It explores themes like the evolution and making of the American Constitution, Union Legislature and Executive, Judiciary and the problems in the working of the constitutional system.

Course Outcomes:

After the completion of this course, the students will be able to:

- | | |
|------------------|---|
| M POL(E) –13-i.1 | Comprehend the process of evolution and making of American Constitution. |
| M POL(E) –13i.2 | Critically analyze the relation between Union Legislature & Executive in USA. |
| M POL(E) –13-i.3 | Develop a deeper understanding of the Judicial system of USA. |
| M POL(E) –13-i.4 | Understand the problems in the working of the American Constitutional System. |

Note: The question paper will consist of nine questions. The candidate shall attempt five questions in all. Question No. 1 will be compulsory. The compulsory question will consist of four short answer type conceptual/thematic questions of equal marks (i.e. 4 marks each) spread over the whole syllabus. The Candidate shall attempt four more questions selecting at least one from each Unit. Each question will carry 16 marks.

- | | |
|-----------------|--|
| UNIT-I | Constitutional Basis: Historical and Philosophical; Evolution and Making of Constitution; Basic Features. Fundamental Rights of Citizens, Federalism, Amendment Process. |
| UNIT-II | Union Legislature & Executive: President – Election, Power & Position; Congress – Composition, Power & Position. |
| UNIT-III | Judiciary System: Supreme Court of USA, Judicial Review, Independence of Judiciary, Lower Courts. |
| UNIT-IV | Problems in the Working of Constitutional System. |

Suggested Readings

1. Lawrence Dodd, *The Dynamics of American Politics*, 1994.
2. Schlesinger, *Running for President: The Candidates and Their Images*, 1994.
3. Hill, *Real Life Dictionary of American Politics*, 1994.
4. P.S., Paludan, *The Presidency of Abraham Lincoln*, 1994.
5. Sidney Milkis, *The American Presidency: Origins Development*, 1994.
6. Robert Ross, *American National Government*, 1993.
7. Schneider, *Legislative Strategy: Shaping Public Policy*, 1993.
8. Baumgartner, *Agendas and Instability in American Politics*, 1993.
9. Max Skidmore, *American Government: A Brief Introduction*, 1992.
10. E.J., Dionne, *Why Americans hate Politics*, 1991.
11. Connelly, *Almanac of American Presidents: From 1789 to the Present*, 1991.
12. Steven Smith, *Committees in Congress*, 1990.
13. Blumenthal, *Pledging Allegiance: The Last Campaign of the Cold War*, 1990.

Mapping Matrix of Course M POL (E) – 13-i

Mapping: Mapping is a process of representing the correlation between COs and POs, COs and PSOs in the scale of 1 to 3 as follows (Table 1):

Table 1: Scale of mapping between COs and POs

Scale	
1	If the contents of course have low correlation (i.e. in agreement with the particular PO to a small extent) with the particular Programme outcome
2	If the contents of course have medium correlation (i.e. in agreement with the particular PO to a reasonable extent) with the particular Programme outcome
3	If the contents of course have strong correlation (i.e. in agreement with the particular PO to a large extent) with the particular Programme outcome

Same scale may be used to define the correlation between Cos and PSOs

Mapping of Course Outcomes to Programme Outcomes: (CO-PO Mapping Matrix)

Table 2 shows the CO-PO mapping matrix for a course (M POL (E)–13-i) assuming that there are 12 POs and 4COs.

Table 2: CO-PO Matrix for the Course M POL (E) – 13-i

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
M POL(E)-13-i.1	3	3	3	-	-	3	3	2	3	3	2	3
M POL(E)-13-i.2	3	3	3	-	-	3	3	2	3	2	2	3
M POL(E)-13-i.3	3	3	3	-	-	3	3	2	3	2	2	3
M POL(E)-13-i.4	3	3	3	-	-	3	3	2	3	3	2	3
Average	3	3	3	-	-	3	3	2	3	2.5	2	3

Note: It is not necessary that each CO has a correlation with all the POs.

Mapping of Course Outcomes to Programme Specific Outcomes: (CO-PSO Mapping Matrix)

Table 3 shows the CO-PSO mapping matrix for a course (M POL (E)–13-i) assuming that there are 4 PSOs and 4COs.

Table 3: CO-PSO Matrix for the Course M POL(E) – 13-i

CO	PSO 1	PSO 2	PSO 3	PSO 4
M POL(E)-13-i.1	3	3	3	3
M POL(E)-13-i.2	3	3	3	2
M POL(E)-13-i.3	3	3	3	3
M POL(E)-13-i.4	3	3	3	3
Average	3	3	3	2.75