Learning Outcomes Based Curriculum Framework (LOCF)

CBCS CURRICULUM (2021-22)
Program Name: M.A./M.Sc. (Geography)
(For the Batches Admitted from 2021-2022)

Department of Geography
Ch. Devi Lal University, Sirsa
(2021)

CBCS CURRICULUM (2021-22)
Program Name: M.A./M.Sc. (Geography)
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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.

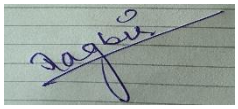
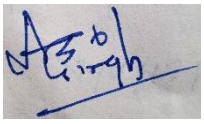
MISSION

- To provide quality education to aspiring young minds for improving their skills, inculcating values, creating leadership qualities and enhance research with innovative methods.
- To produce young geographers who would contribute in the areas of higher education, regional and national planning, development, environment, ethics and sustainable environment development.
- 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**

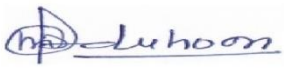
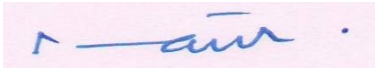
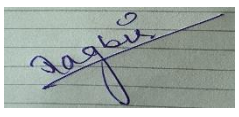
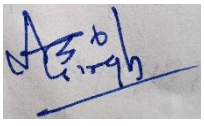




Program Outcomes (PO) with Post Graduate Attributes

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 Social Science, Ch. Devi Lal University, Sirsa

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

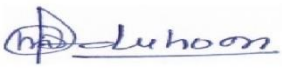
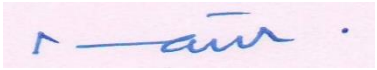
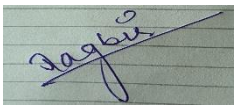
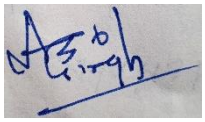
Program Specific Outcomes (PSO's):

- **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.

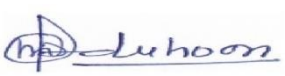
- **PSO3:** Learning the techniques of data acquisition, data processing and interpretation of locational and spatial data.

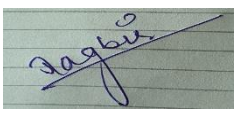
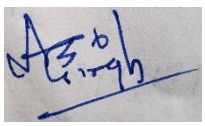
- **PSO4:** Ability to demonstrate and communicate the geographical knowledge and inculcate analytical ability, research aptitude and relevant skills.

Proposed syllabus and Scheme of Examination for M.A./M. Sc.
Under Learning Outcomes based Curriculum Framework (LOCF)
Submitted to
Chaudhary Devi Lal University
Subject: Geography

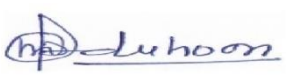
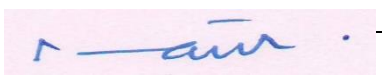
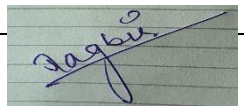
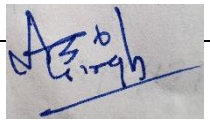
Course Code and Type	Nomenclature of the Paper	Credits	Hours/Week	External Marks	Internal Marks	Total Marks
Semester-1st						
MA/M.Sc./GEO/1/CC1	Climatology	4	4	70	30	100
MA/M.Sc./GEO/1/CC2	Geography of India	4	4	70	30	100
MA/M.Sc./GEO/1/CC3	Economic Geography	4	4	70	30	100
MA/M.Sc./GEO/1/CC4	Statistical Methods in Geography	4	4	70	30	100
CHOOSE ANY TWO FROM GIVEN OPTIONS						
MA/M.Sc./GEO/1/DSC 1	Geography of Rural Settlements	4	4	70	30	100
MA/M.Sc./GEO/1/DSC 2	Agricultural Geography with Special Reference to India	4	4	70	30	100
MA/M.Sc./GEO/1/DSC 3	Urban Geography	4	4	70	30	100
MA/M.Sc./GEO/1/DSC 4	MOOC & SWAYAM Programme	4	4	70	30	100
CHOOSE ANY ONE FROM GIVEN OPTIONS						
MA/M.Sc./GEO/1/SEC 1	Cartographic Methods in Geography (Practical)	4	8	70 Lab Work	20 Viva-voce 10 File Record	100
MA/M.Sc./GEO/1/SEC 2	Computer Aided Statistical Diagrams and Graphs (Practical)	4	8	70 Lab Work	20 Viva-voce 10 File Record	100
Semester-2nd						
MA/M.Sc./GEO/2/CC5	Geomorphology	4	4	70	30	100
MA/M.Sc./GEO/2/CC6	Regional Planning in India	4	4	70	30	100
MA/M.Sc./GEO/2/CC7	Oceanography	4	4	70	30	100
MA/M.Sc./GEO/2/CC8	Morphometric Analysis(Practical)	4	8	70 Lab Work	20 Viva-voce 10 File Record	100
CHOOSE ANY ONE FROM GIVEN OPTIONS						
MA/M.Sc./GEO/2/DSC 5	Tourism Geography	4	4	70	30	100
MA/M.Sc./GEO/2/DSC 6	Political Geography	4	4	70	30	100
CHOOSE ANY ONE FROM GIVEN OPTIONS						
MA/M.Sc./GEO/9/OEC 1	General Geography of India	**4**	4	70	30	100
MA/M.Sc./GEO/9/OEC 2	Climate Change and Disaster Management	4	4	70	30	100
Semester-3rd						
MA/M.Sc./GEO/3/CC9	Hydrology	4	4	70	30	100
MA/M.Sc./GEO/3/CC10	Geography and Ecosystems	4	4	70	30	100
MA/M.Sc./GEO/3/CC11	Introduction to Remote Sensing (Theory)	4	4	70	30	100
MA/M.Sc./GEO/3/CC12	Population Geography	4	4	70	30	100
CHOOSE ANY TWO FROM GIVEN OPTIONS						
MA/M.Sc./GEO/3/DSC 7	Geography and Disaster Management	4	4	70	30	100
MA/M.Sc./GEO/3/DSC 8	Fluvial Geomorphology	4	4	70	30	100
MA/M.Sc./GEO/3/DSC 9	Natural Resource Management	4	4	70	30	100
MA/M.Sc./GEO/3/SEC 3	Introduction to Remote Sensing (Practical)	4	8	70 Lab Work	20 Viva-voce 10 File Record	100
MA/M.Sc./GEO/9/OEC 3	General Geography of World	4	4	70	30	100
Semester-4th						
MA/M.Sc./GEO/4/CC13	Geographical Thought	4	4	70	30	100
MA/M.Sc./GEO/4/CC14	Research Methodology	4	4	70	30	100
MA/M.Sc./GEO/4/CC15	Fundamental Of Geographical Information Systems (Theory)	4	4	70	30	100
MA/M.Sc./GEO/4/CC16	Cardinal Principles Of Academic Integrity	2	2	30	20	50
CHOOSE ANY TWO FROM GIVEN OPTIONS						
MA/M.Sc./GEO/4/DSC 10	Aeolian Geomorphology	4	4	70	30	100
MA/M.Sc./GEO/4/DSC 11	Geography of Water Resources	4	4	70	30	100
MA/M.Sc./GEO/4/DSC 12	Soil Geography	4	4	70	30	100
MA/M.Sc./GEO/4/SEC 4	Fundamental of Geographical Information Systems (Practical)	4	8	70 Lab Work	20 Viva-voce 10 File Record	100



Course Wise Content Details

MA/M.Sc. Geography
1st Semester

Course Title: Climatology-I Course Code: MA/M.Sc./GEO/1/CC 1	**Total Credits : 4** **Time : 3 Hrs.** **Marks : 100** **External : 70** **Internal : 30**

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Enhancement of knowledge about atmospheric constituents and structure.
CO2	Development of scientific understanding about climatic elements and their characteristics.
CO3	Sharpens the understanding about atmospheric moisture, stability, instability and weather systems.
CO4	Enrichment of knowledge about climatic classification, climate change and global warming.

UNIT-1

Definition of weather and climate; Climatology and Meteorology. Origin, composition and structure of atmosphere. Solar radiation, greenhouse effect, heat budget and temperature distribution.

UNIT-2

Atmospheric pressure and its distribution pattern. Theories of general circulation and planetary winds. Walker circulation- ENSO and La Nina, origin of monsoons and jet streams.

UNIT-3

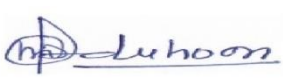
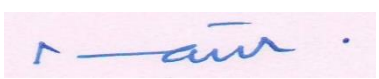
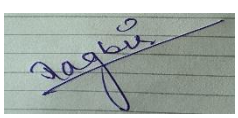
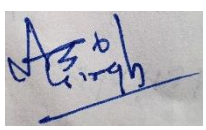
Atmospheric Moisture: humidity, evaporation, condensation; precipitation formation theories and types of precipitation, acid rain. Stability and instability of atmosphere, air masses and fronts. Weather systems: Origin and characteristics of extra tropical and tropical cyclones.

UNIT-4

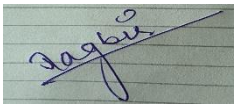
Climatic classification: Bases of climatic classification by Koeppen, Trewartha and Thornthwaite. Climatic change: pattern, evidences and theories of climate change. Global warming and its impacts on earth systems.

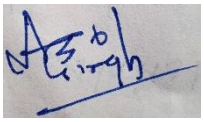
Reading List

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.





Course Title: Geography of India-I Course Code: MA/M.Sc./GEO/1/CC2	**Total Credits : 4** **Time : 3 Hrs.** **Marks : 100** **External : 70** **Internal : 30**

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Provides understanding about the physical structure of India.
CO2	Enrichment of understanding about spatial organization of agriculture and irrigation systems.
CO3	Acquaintance with geographical distribution and production of major resources.
CO4	Enhancement of knowledge about spatial distribution of industries and international trade of India.

UNIT-1

Physiography: relief characteristics and physiographical divisions. Drainage systems and their functional significance. Climate: characteristics, seasons and climatic regions of India. Soil and vegetation types: their distribution, characteristics and conservation.

UNIT-2

Agriculture: major characteristics, agricultural development. Problems of Indian agriculture. Irrigation: types, major projects with reference to Bhakra Nangal, Narmada and Damodar Valley Projects.

UNIT-3

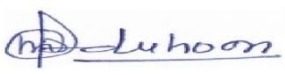
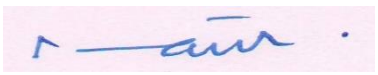
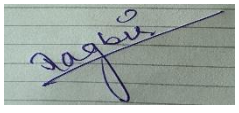
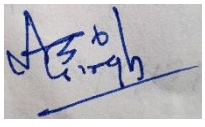
Production, distribution, status of use and conservation of metallic minerals: iron ore and bauxite. Production, distribution, status of use and conservation of non-metallic minerals: mica and manganese. Production, distribution, status of use and conservation of following power resources: coal, petroleum and hydropower.

UNIT-4

Production and distribution of (a) iron and steel (b) cotton textile (c) sugar and (d) automobile industry. Major industrial regions and their characteristics. International trade: major exports and imports.

Reading List

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. Tiwari, R. C.: Geography of India, Prayag Pustak Bhawan, Allahabad.

Course Title: Economic Geography-I Course Code: MA/M.Sc./GEO/1/CC3	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Provides understanding about the location and distribution of economic activities.
CO2	Familiarization with location theories of economic activities.
CO3	Acquaintance with the spatial organization of world economies.
CO4	Knowledge about trade blocs, trends in trade and various processes of globalization.

UNIT-1

Definition, nature, scope, importance, recent trends and approaches in economic geography. Relationship of economic geography with economics. Economic activities and their classification.

UNIT-2

Network structure and economic activities, impact of transport on economic activities, spatial variation in production and transport cost. Location theories of Weber, Losch, Christaller, Ullman and Krugman.

UNIT-III

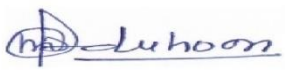
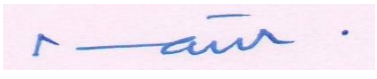
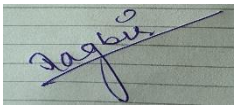
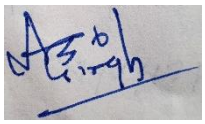
World Economies: bases of classification, patterns and characteristics of developed and developing economies of the world. Economic development: meaning, evolution, goals, measures, patterns, problems and theories.

UNIT-IV

Globalization and recent trends in pattern of international trade. Emergence of a new global economy-transnational integration and its spatial outcomes. Major regional trade blocks of the world, free trade initiatives (GATT, UNCTAD, WTO).

Reading List

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. Knox, P. 2003. The Geography of World Economy. Arnold, London.
5. Saxena, H.M. 2013. Economic Geography. Rawat Publications, Jaipur.

Course Title: Statistical Methods in Geography-I Course Code: MA/M.Sc./GEO/1/CC4	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Introduction to tools of quantitative information and data.
CO2	Enhancement of knowledge about statistical analysis of spatial pattern from geographical data.
CO3	Enrichment of knowledge about inferential data analysis and errors associated with it.
CO4	Acquaintance with bivariate and multivariate analytical techniques.

UNIT-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. Measures of dispersion: absolute measures: range, quartile deviation, mean deviation, standard deviation, relative measure of dispersion: coefficient of variation.

UNIT-2

Normal curve as a probability distribution: characteristics and area under curve. Measure of inequality: location quotient and Lorenz curve. Sampling: theory, methods, distribution and chance errors.

UNIT-3

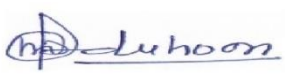
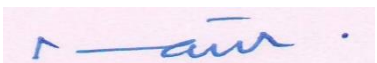
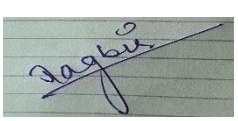
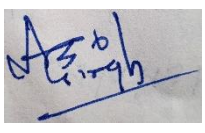
Bivariate analysis: scatter diagram, correlation analysis, Spearman's rank correlation and Karl Pearson's correlation coefficient, test of significance. Simple linear regression model: properties of least square estimate, coefficient of determination.

UNIT-4

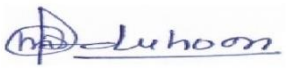
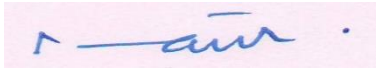
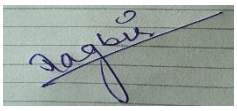
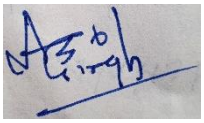
Residuals and their mapping**.** Basics of multivariate analysis: correlation matrix, partial and multiple correlation**.**

Reading List

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.

Course Title: Geography of Rural Settlements-I Course Code: MA/M.Sc./GEO/1/ DSC 1	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Understanding about the fundamental concepts of settlement geography.
CO2	Enhancement of knowledge about types and patterns of rural settlements.
CO3	Acquaintance with various social issues in rural settlements.
CO4	Knowledge about environmental issues and rural development planning in India.

UNIT-1

Nature, scope, significance and development of settlement geography. Approaches in rural settlement geography. 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-2

Rural Settlement: types, forms and patterns. Regionalization of rural settlements with special reference to India.

UNIT-3

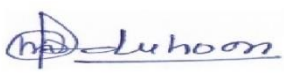
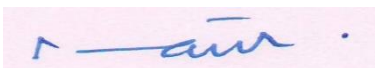
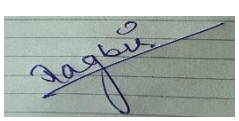
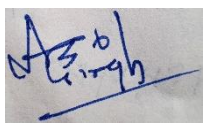
Social issues in rural settlements: Poverty, housing, health care and inequality in India. Cultural landscape elements in rural settlements: House type and field pattern.

UNIT-4

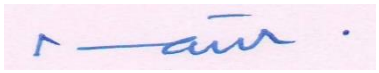
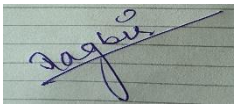
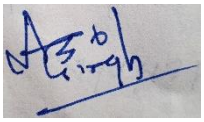
Environmental issues in rural settlements. Rural development planning in India.

Reading List

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 & Byod, 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.

Course Title: Agricultural Geography with Special Reference to India-I **Course Code: MA/M.Sc./GEO/1/ DSC 2**	**Total Credits : 4** **Time : 3 Hrs.** **Marks : 100** **External : 70** **Internal : 30**

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Enrichment of knowledge about origin, location and distribution of agricultural activities.
CO2	Enhancement of knowledge about changing land use and cropping pattern.
CO3	Acquaintance with agricultural systems, efficiency and productivity.
CO4	Awareness about impacts of climate change and economic liberalization on agriculture.

UNIT-1

Nature, scope and significance of agricultural geography. Origin and dispersal of agriculture in the World. Determinants of agricultural patterns: physical, technological and cultural factors.

UNIT-2

Concepts of land capability survey, land use and cropping pattern. Agricultural Concepts: intensity of cropping, Degree of commercialization, Cropping diversification and concentration, Crop combination, Contract framing and agri-business. Approaches in agricultural regionalization: Von Thunen Model of agricultural land use, Agro-climatic zonation: Concept and Indian experience.

UNIT-3

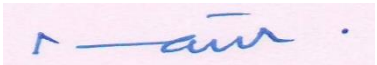
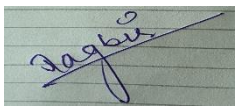
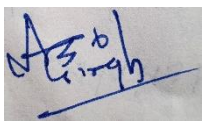
Bases of identification of agricultural systems by Whitllesey and agricultural typology by Kostrowiki. Measurements of agricultural efficiency and productivity. Green revolution: Its impacts and consequences in India.

UNIT-4

Food production and security in India. Neo-liberalization and Indian agriculture. Agriculture and climate change: impacts and adaptation.

Reading List

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. Singh Jasbir and Dhillon S.S. (1994) Agricultural Geography. Tata Mc Graw Hill, New Delhi.
6. Safi, Mohammad (2007) Agricultural Geography. Prentice-Hall of India.
7. Singh Jasbir (1989) Agricultural Geography.

Course Title: Urban Geography-I Course Code: MA/M.Sc./GEO/1/ DSC 3	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Provides understanding about evolution of towns and pattern of urbanization.
CO2	Enrichment of knowledge about economic and functional characteristics of cities.
CO3	Acquaintance with urban morphology and land use models.
CO4	Familiarization with theories of urban development.

UNIT-1

Urban geography: concepts, nature and scope. Approaches to study urbanization and urban systems Origin and evolution of towns and factors of urban growth; theories of urban origins. The global context of urbanization: trends and pattern; cycle of urbanization.

UNIT-2

Economic base of cities: concept and employment ratio. Functional classification of cities: concepts and scheme of classification. Rural Urban Fringe: structural characteristics and its development. City and region: concepts of influence and dominance, methods of delimitation of area of influence and dominance. SEZ: concept, policies and consequences.

UNIT-3

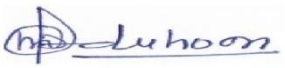
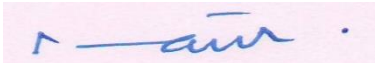
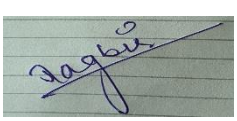
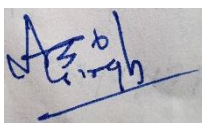
Urban morphology and land use structure: city core, commercial, industrial and residential areas. Classical models of city structure: concentric zone model by E.W. Burgess, sector model by Homer Hoyt, multiple nuclei model by Harris and Ullman, Modifications of the classical models: Kearsley' modifications of Burgess model, Mann's model of midsize British city, White's model of the 21st century city and Vance's urban realms model. 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-4

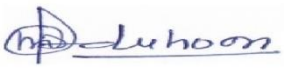
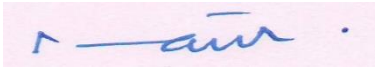
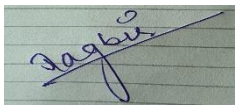
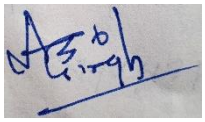
Social Area Analysis; Bases of residential segregation. Diffusion theories by Bylund, Morril, Hudson and Vance. Rank size rule. Law of primate city.

Reading List

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 Halm, 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. Southhall, A. (1998) The City in Time and space, Cambridge University Press, Cambridge.

Course Title: Cartographic Methods in Geography (Practical)-I Course Code: MA/M.Sc./GEO/1/ SEC 1	Total Credits: 4 Time : 3 Hrs. Marks : 100 Lab work : 70 Viva voce : 20 File : 10

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Awareness about various types of cartographic diagrams.
CO2	Enrichment of skills to prepare the thematic maps and diagrams.
CO3	Acquisition of skills to represent the statistical data.
CO4	Capability to understand and interpret the graphs/diagrams/maps.

UNIT-1

Simple Diagrams: Line and bar graph, Poly graph, Rainfall deviation diagram; One dimensional diagrams: Simple, Comparative bar, Compound bar, Trend graph; Two dimensional diagrams: Pie diagram, Proportional circle; Three dimensional diagrams: Sphere.

UNIT-2

Weather Diagrams: Climograph (Taylor and Foster), Hythergraph, Ergograph, Wind rose diagram, Isopleth.

UNIT-3

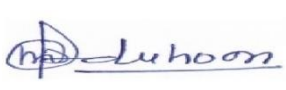
Distribution maps: Dot method, Choropleth- Monovariate, Choropleth- Bivariate.

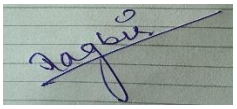
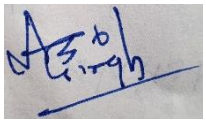
UNIT-4

Diagrams: Age and Sex pyramid, Snail Diagram, Cartogram (rectangular, traffic flow).

Reading List

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.



Course Title: Computer Aided Statistical Diagrams and Graphs (Practical)-I Course Code: MA/M.Sc./GEO/1/ SEC 2	Total Credits : 4 Time : 3 Hrs. Marks : 100 Lab work : 70 Viva voce : 20 File : 10

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Development of understanding about the fundamental concepts of computer.
CO2	Enrichment of knowledge about use of computer and assembling computer.
CO3	Familiarization with the processes of computer program.
CO4	Knowledge about short keys and others computer's icons.

UNIT-1

Introduction to Computer: Basic Applications of Computer; Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software; Concept of Computing.

UNIT-2

The process of writing of data disks (e.g. Census of Indian data disks); Use of Computers in Geography. Data and Information; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply.

UNIT-3

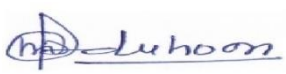
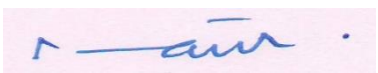
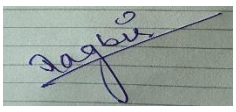
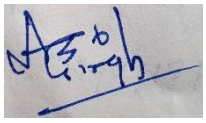
Introduction to MS - Excel: Drawing of line graph, Bar Diagram, Pie diagram, Scatter diagram, (changes from colour to different shade patterns, placement of Legend, different weight to X and Y coordinates, Placement of Headings and Sub-headings, Font Size, Style, Bold and Italics.

UNIT-4

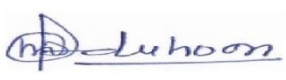
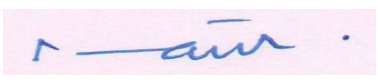
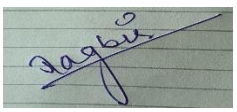
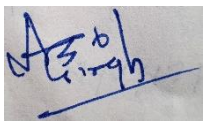
What is an Operating System; Basics of Popular Operating Systems; The User Interface, Using Mouse; Using right Button of the Mouse and Moving Icons on the screen, Use of Common Icons, Status Bar, Using Menu and Menu-selection, Running an Application, Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows; Using help; Creating Short cuts.

Reading list

1. Robinsin, A., Morrison,J.L.,Muehrcke.P.C. and Guptil,S.C.(2002) Elements of Cartography, John Willey.
2. Taylor, D.R.F.(1985) Education and Training in Contemporary Cartography, John Willey.
3. Jil D., Charles W., Mohsen,M. (2016)Cartographic Grounds: Projecting the Landscape Imaginary, Prinston Press, New York.

MA/M.Sc. Geography
2nd Semester

Course Title: Geomorphology-II Course Code: MA/M.Sc./GEO/2/ CC5	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Development of understanding about the fundamental concepts of geomorphology
CO2	Enrichment of knowledge about tectonic activities and hill slope relationship.
CO3	Familiarization with the processes and patterns shaping the landforms.
CO4	Understanding of environmental management using principles of applied geomorphology

UNIT-1

Introduction to geomorphology as a science: definition, nature, scope and recent developments. Fundamental concepts: geological structure and landforms, uniformitarianism, multi-cycle and polygenetic evolution of landscape, frequency concept of geomorphic processes, climatogenetic geomorphology and peneplain and pediplain.

UNIT-2

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. 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-3

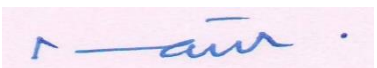
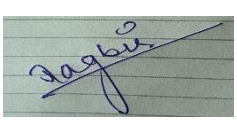
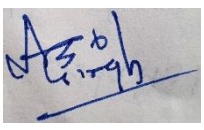
Weathering: Causes; types of weathering: physical, chemical and biological. Mass movement, causes, classifications and types of mass movements- slow and rapid mass movements.

UNIT-4

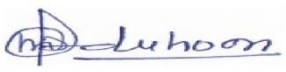
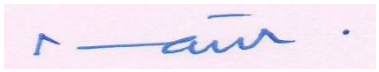
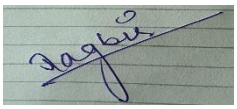
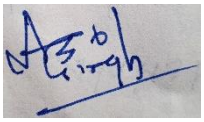
Geomorphic processes and resulting land forms: Fluvial, Glacial, Periglacial, Aeolian and Karst. Applied geomorphology: meaning and concept, role of geomorphology in environmental management of the following: (i) accelerated erosion and sedimentation, (ii) construction of large dams (iii) urban floods.

Reading list

1. Bloom AL. 2002. Geomorphology: A systematic Analysis of late Cenozoic landforms. Prentice-Hall Private Limited, New Delhi.
2. Embleton, C and Thormne. 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, Win C. 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.

Course Title: Regional Development and Planning with Special Reference to India-II Course Code: MA/M.Sc./GEO/2/ CC6	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For the Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Understanding of basic concepts of regional planning and development.
CO2	Acquaintance with models of regional development.
CO3	Enrichment of knowledge about regional disparities and challenges in India.
CO4	Awareness about developmental plans and strategies in India.

UNIT-1

Concept of regional development, regional disparities, balanced regional development. Region and its typology, Basis of regionalization in India and their characteristics.

UNIT-2

Theories of regional development, Trickle Down Theory, Growth Pole Theory, Cumulative causation Model, Core-Periphery Theory, Concept of sustainable development, inclusive growth and eco-feminism.

UNIT-3

Development and regional disparities in India since Independence, Disparities in Agricultural Development, Disparities in Industrial Development, Disparities in human resource development in terms of poverty, education and health.

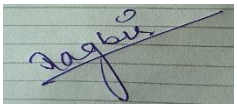
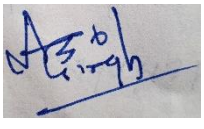
UNIT-4

India through Planned Era with special reference to, **T**ribal area development plan, Hill Area development plan, Desert, drought prone and backward area development plan, Niti Ayog: aims and objectives**,** Urban planning in India with special reference to National Capital Region**.**

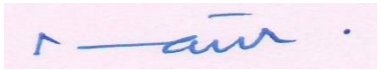
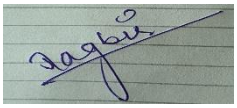
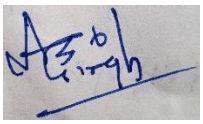
Reading list

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.

Course Title: Oceanography-II Course Code: MA/M.Sc./GEO/2/ CC7	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	To know the scope and nature and oceanography with understanding of Wegner's drift hypothesis and sea floor spreading.
CO2	Learn about features of ocean basins, sea floor profiles and configuration of pacific, Atlantic and Indian ocean along with coral reefs formation.
CO3	Understanding the physical and chemical properties of sea water, currents of Atlantic, pacific and Indian oceanic along with their impact on climate and economy.
CO4	Know about oceans as source of food, mineral and energy resources, human impact on marine environment.

UNIT-1

Nature and Scope of Oceanography Definition, Nature and Scope of Oceanography; Distribution of Land and Water; Thermohaline Circulation and its association with the global climate, Origin of Ocean Basins.

UNIT-2

Features of Ocean Basins; Continental Margins and Deep Oceanic Basins; Oceanic Floor Profile: Continental self, Slope, Ridge and Deeps, Abyssal Plains; Submarine Canyons; Coral reefs: Types, Origin and Distribution; Configuration of Ocean Floor of Indian, Atlantic and Pacific Ocean.

UNIT-3

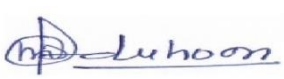
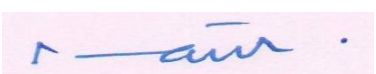
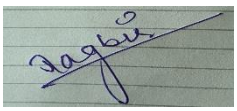
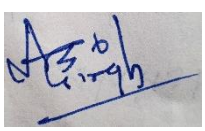
Ocean Currents: origin, types and dynamics; Currents of Pacific, Atlantic, and Indian ocean; Impact of ocean currents; Climate change and ocean circulation, Physiochemical properties of sea water: Temperature, Density, Salinity and Dissolved Gases; Ocean movement: Waves, Tides; (Theory of Tides)and currents.

UNIT-4

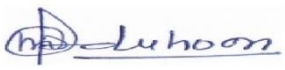
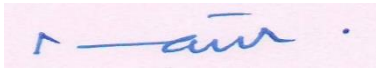
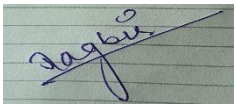
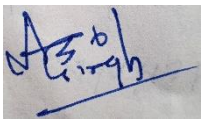
Life in the Ocean: Bio zones; Types of Organism- Plankton, Nekton and Benthos; Ocean and livelihood; Oceans as Source of Food, Mineral and Energy Sources; Oceans Deposits; Sea Level Change: Evidences and Impacts; Sustainable marine environment.

Reading list

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, Kisalaya 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.

Course Title: Morphometric Analysis (Practical)-II Course Code: MA/M.Sc./GEO/2/ CC8	Total Credits : 4 Time : 3 Hrs. Marks : 100 Lab work : 70 Viva voce : 20 File : 10

Note: For The Paper Setter
The question paper shall contain Ten questions in all. Candidate(s) are required to attempt any Five questions. All questions will carry equal marks.

Course Outcomes

CO1	Acquisition of skills to extract physical and cultural information from topographical maps.
CO2	Knowledge of drawing of transverse and longitudinal profiles.
CO3	Ability to represent the linear, areal and relief aspects of drainage basin.
CO4	Capability to prepare the slope and relative relief maps of drainage basin.

UNIT-1

Representation of physical features, Representation of cultural features, Delineation of watershed (All exercises shall be based on it).

UNIT-2

Profile analysis: transverse and longitudinal. Serial profiles, Superimposed profiles, Composite profiles, Projected profiles, Longitudinal profile. Linear Aspects: Relationship between stream order and stream Number, Relationship between stream order and average stream length, Bifurcation ratio.

UNIT-3

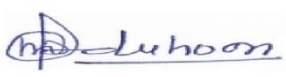
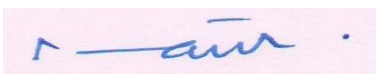
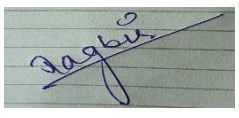
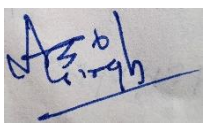
Areal Aspects: Drainage frequency, Drainage Density. Relief Aspect: Area height Curve, Altimetric frequency curve.

UNIT-4

Hypsographic curve,Hypsometric integral curve, Clinographic curve, Slope Analysis: Wentworth's method of average slope , G. H. Smith's method of relative relief.

Reading list

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.

Course Title: Tourism Geography-II Course Code: MA/M.Sc./GEO/2/ DSC-5	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Familiarization with the fundamentals of tourism geography.
CO2	Awareness about motivating factors of tourism
CO3	Acquaintance with eco-tourism potentials and socio-economic impacts of tourism.
CO4	Knowledge about impact of globalization and foreign capital on tourism development.

UNIT-1

Definition, nature, scope and significance of tourism geography, Factors influencing tourism: historical, physical, socio-cultural and economic.

UNIT-2

Motivating factors of tourism: leisure, recreation, spiritual, attraction of site and situation, Infrastructure and support system of tourism accommodation and supplementary accommodation.

UNIT-3

Eco-Tourism potentials in India with reference to northern mountains and plains, peninsula, coastal regions and islands, Impact of tourism: physical, economic and social.

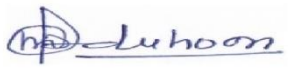
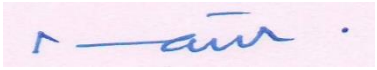
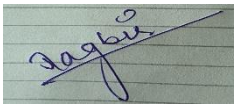
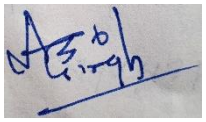
UNIT-4

Environmental laws and tourism, Impact of globalization and foreign capital on tourism development. Government policies for tourism development.

Reading list

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.

Course Title: Political Geography-II Course Code: MA/M.Sc./GEO/2/ DSC-6	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Familiarization with the conceptual framework of geo-political issues
CO2	Augmentation of knowledge about state and nation in geographic perspective
CO3	Enhancement of knowledge about global strategic views and geo-politics inpost-cold war era.
CO4	Awareness about contemporary geo-political situation and issues in India.

UNIT-1

Nature and scope of political geography, its approaches and recent trends, School of thoughts: political economy, world system, globalization**.**

UNIT-2

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, Distinction between frontiers and boundaries, demarcation of boundaries, classification and functions of boundaries, Landlocked state: advantages and disadvantages.

UNIT-3

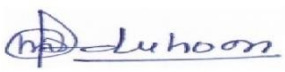
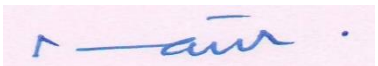
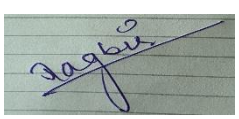
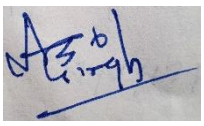
Global strategic views: Mahan and Sea power; Mackinder and Heartland; Spykman and Rimland Servasky and Air power, Geo-politics in the post-cold war world- S.B. Cohen's model of geo-politics.

UNIT-4

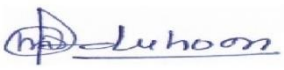
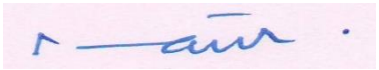
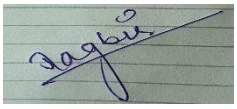
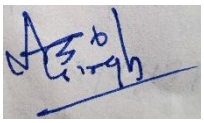
Emergence of India as regional power: geo-political significance of Indian and Pacific Ocean, Geo-political issues in India with special reference to water disputes and riparian claims, Gerrymandering and electoral abuse in India, Kashmir problem and Indo-Pak relations.

Reading list

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. Sukhwal, B.L. Modern Political Geography of India Sterling Publishers, New Delhi. 1968.
12. Taylor, P. Political Geography, Longman, London. 1985.

Course Title: General Geography of India-II Course Code: MA/M.Sc./GEO/9/OEC1	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Learn about locational setting and geographical expansion of India with relief and drainage system.
CO2	Know the importance of climate, soil, natural vegetation.
CO3	Learn the distribution, density and growth of India population.
CO4	Study the socio- cultural attributes of Indian population.

UNIT-1

India: Locational Setting and Geographical Expansion**.** Relief and Drainage Systems.

UNIT-2

Climate, Soil and Natural Vegetation. Regions of India.

UNIT-3

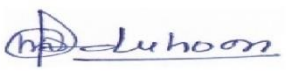
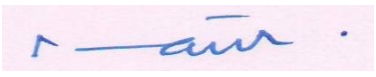
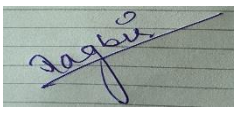
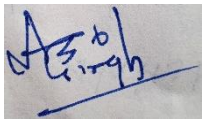
The Peopling of India. Population: Distribution, Density and Growth.

UNIT-4

Population Composition: Ethnic and Socio-cultural Attributes (caste and tribes). Unity in Diversity in India.

Reading list

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, Prayag Pustak Bhawan, Allahabad.

Course Title: Climate Change and Disaster Management-II Course Code: MA/M.Sc./GEO/9/OEC2	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Learn about Climatic variations, Climatic fluctuations and change.
CO2	Know the importance of Earth's Greenhouse effect and global warming.
CO3	Learn the Regional extreme events in India
CO4	Study the disaster management plans.

UNIT-1

Climatic variations, Climatic fluctuations and change, Past climates and evidences of climate change.

UNIT-2

Earth's Greenhouse effect and global warming, World climate policy framework: Rio Summit, Kyoto Protocol.

UNIT-3

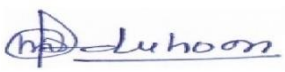
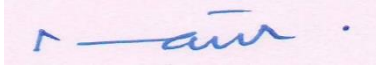
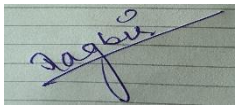
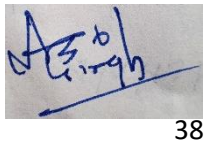
Regional extreme events in India: earthquakes, floods, drought, cyclone. Disaster magnitude and impacts: examples from recent disasters.

UNIT-4

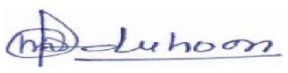
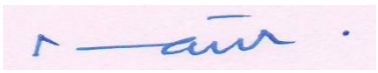
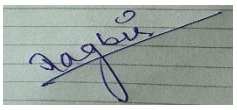
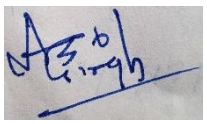
Understanding manmade disasters, fires and forest fires; nuclear, biological and chemical disaster, awareness among people, capacity building, disaster management plan.

Reading list

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 Premier, 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.

MA/M.Sc. Geography
3rd Semester

Course Title: Hydrology-III Course Code: MA/M.Sc./GEO/3/ CC9	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Know the theoretical framework of regional geography. Types of region and methods of delineation with regional development and regional planning approaches.
CO2	Learn about special purpose and problem based regional planning in India.
CO3	Learn various regional economic growth theories.
CO4	Study about regional imbalance, regional development strategies, planning and policies in India.

UNIT-1

Definition, nature, scope, importance and historical development of hydrology. Relationship of hydrology with other physical sciences.

UNIT-2

Inventory of Earth's water, quality and quantity. Distribution of water - local, regional and global. Application of isotopes in hydrology. Hydrology of India. Hydrological cycle, estimation of global water budget, human impact on hydrological cycle.

UNIT-3

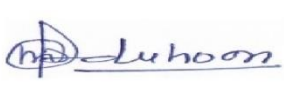
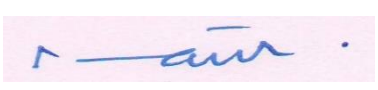
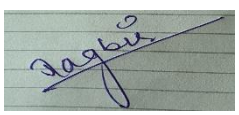
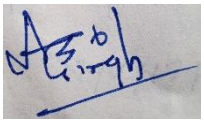
Rainfall: frequency, intensity and measurement accuracy, determination of average rainfall (arithmetic mean, Theiesson polygon, isohyetal methods); types of variations in rainfall. Hydrograph: components, analysis, separation methods, affecting factors; variations in runoff, rainfall-runoff relationship.

UNIT-4

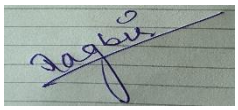
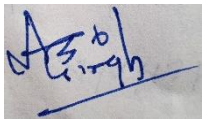
Surface water resources: precipitation, infiltration, water balance, Evapo-transpiration and runoff, Drainage basin. Stream discharge parameters and its measurement, River Hydrographs. Surface water and ground water interaction.

Reading list

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, Kisalaya 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.

Course Title: Geography and Ecosystems-III Course Code: MA/M.Sc./GEO/3/ CC10	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Familiarization with the concept and elements of ecosystem.
CO2	Enrichment of knowledge about the characteristics of different biomes.
CO3	Awareness about the inter-linkages between human artifacts and natural environment.
CO4	Acquaintance about world environmental problems and policy framework.

UNIT-1

Geography and ecosystem: fundamental concepts. Concept of ecosystem: bases, types, components and function of ecosystem. Energy flow in ecosystem: food chain, food web, trophic levels, ecological production and ecological pyramids. Biogeochemical cycles: hydrological, carbon, oxygen and nitrogen cycles.

UNIT-2

Biome: scheme of classification: factors affecting the distribution of biomes. Salient features of the following biomes: Tropical evergreen rain forest biome, Savanna biome, Monsoon biome, Temperate biome, Marine biome, Mountain biome, Desert biome; Ecosystem approach and its relevance in geography.

UNIT-3

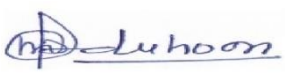
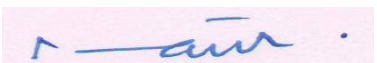
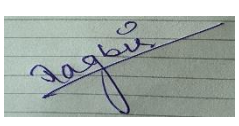
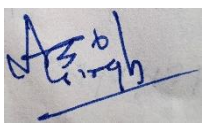
Man-environment relationship: classification of resources; use and ecological imbalance with reference to soils, forests and energy resources. Concept of air, water, and noise pollution: level of problem, causes and measurement tools. Biodiversity and conservation: preservation and conservation of ecosystem through resource management.

UNIT-4

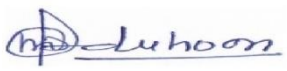
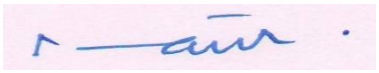
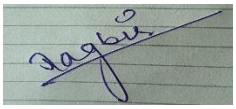
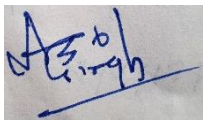
Environmental issues: climate change, ozone depletion, global warming and global cooling. International efforts for environment management and conservation: The Stockholm Conference, the Earth Summit, Kyoto Protocol, Paris declaration and after. Environment Governance: environment policies and environmental legislation in India: prevention & protection Act of wild life, water, air, forest, environment protection and National Environment Tribunal Act.

Reading list

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. Merril 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, Massachusets, 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.

Course Title: Introduction To Remote Sensing-III Course Code: MA/M.Sc./GEO/3/ CC11	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Acquaintance with fundamentals of remote sensing.
CO2	Development of capability to interpret the aerial photographs.
CO3	Enrichment of skills to extract information from resource satellite imageries.
CO4	Awareness about digital image processing and its applications in resource monitoring and mapping.

UNIT-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.

UNIT-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-3

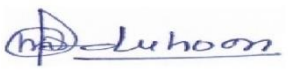
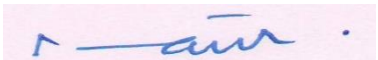
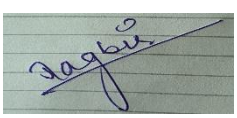
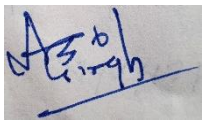
Concept of Multispectral, Thermal and Hyper spectral remote sensing. Major earth resource Satellites: LANDSAT, SPOT and IKONOS. Indian Space Program and characteristics of Indian remote sensing satellite and data.

UNIT-4

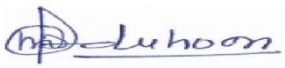
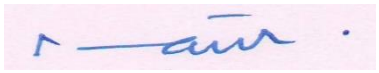
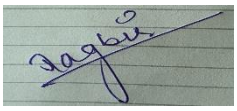
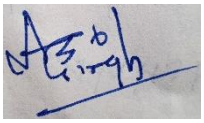
Digital Image processing and application: image restoration and correction. Image classification: supervised and unsupervised. Applications in resource mapping and monitoring.

Reading list

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, TM. and Keffer R. (1994) Remote Sensing and Image Interpretation, John Willy & 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.

Course Title: Population Geography-III Course Code: MA/M.Sc./GEO/3/ CC12	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Knowledge about population data base, methodological issues and mapping.
CO2	Familiarization with the dynamics of population and demographic dividends.
CO3	Enrichment of knowledge about population theories and models.
CO4	Awareness about population policies of different countries and relation between population and environment.

UNIT-1

Nature and scope of population geography. Methodological problems in population geography. Sources of population data, quality and reliability of data. Problems of mapping population data.

UNIT-2

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.

Demographic dividend: linkages between population and economic development.

UNIT-3

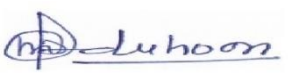
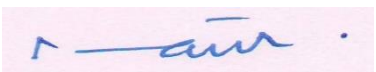
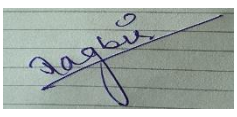
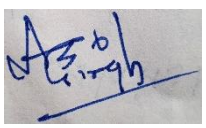
Concepts of over population, under population and optimum population. Demographic transition model. Population resource regions. Theories of population: Malthus, Ricardo and Marx. Limits to growth: concept and application.

UNIT-4

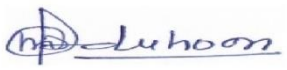
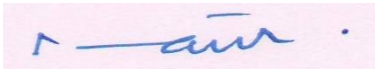
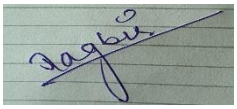
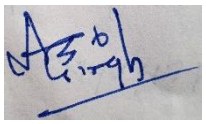
Comparative study of population problems and policies of developed and less developed countries. Developed world: U.S.A., Japan, Canada, Less developed world: India, China and Brazil. Population problems and environmental implications.

Reading list

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. United Nations (1997): Health and Mortality Issues of Global Concern, Proceeding of the Symposium on Health and Mortality, Brussels, 19-22 November 1997.

Course Title: Geography and Disaster Management-III Course Code: MA/M.Sc./GEO/3/ DSC 7	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Understanding about the spatial dimensions and distribution of disasters.
CO2	Enrichment of knowledge about natural and human induced disasters.
CO3	Acquaintance with the concepts of disaster management, vulnerability and mitigation**.**
CO4	Awareness about the role of geospatial technology in disaster management.

UNIT-1

Disasters and hazards: definition, nature and classification. Geography and disasters: major disasters of world, disaster profile of India. Tectonic disasters: volcanoes, earthquakes, tsunamis, landslides.

UNIT-2

Hydrological disasters: floods and droughts. Climatic disasters: cyclones and heavy precipitation events. Human induced disasters: epidemics, industrial and transport disasters; wars and terrorism induced disasters.

UNIT-3

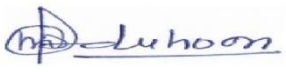
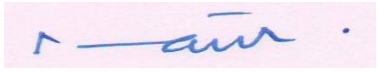
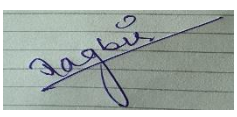
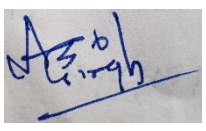
Disaster management in India: policy and organizational structure setup. Disaster vulnerability and affecting factors. Planning for disaster mitigation measures and preparedness.

UNIT-4

Post disaster recovery and rehabilitation. Impacts of disaster on society and economy. Geospatial technology applications in disaster prevention and monitoring.

Reading list

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.

Course Title: Fluvial Geomorphology-III Course Code: MA/M.Sc./GEO/3/ DSC 8	**Total Credits : 4** **Time : 3 Hrs.** **Marks : 100** **External : 70** **Internal : 30**

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Acquaintance with the basic concepts of fluvial system.
CO2	Familiarization with sediment transfer processes and major types of channels.
CO3	Cognizance of flood forecasting and management techniques.
CO4	Awareness about flood plain management using geospatial technology.

UNIT-1

Fluvial System: types, variables, feedbacks, thresholds, responses and scales in fluvial geomorphology. Water erosion: types of water erosion and erosive processes, monitoring of water erosion (field measurements and models) management problems associated with erosion.

UNIT-2

Sediment transfer: sources, modes, storage, movement and measurement of sediment load and yield, controls as sediment yield, human activity and sediment yield. Channel forms and processes: channel types, geometry, size, shape, channel pattern, bedrock channels and associated land forms.

UNIT-3

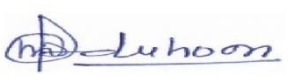
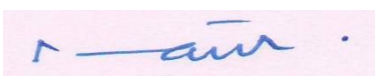
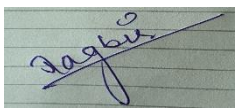
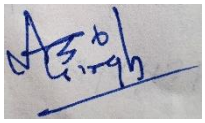
Floods: Flood frequency, magnitude, forecasting and structural and non-structural adjustment to floods, catastrophic and paleo floods. Impact of construction activities on fluvial systems. Human adjustment in floodplains.

UNIT-4

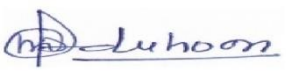
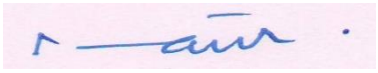
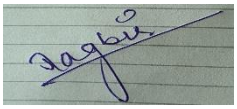
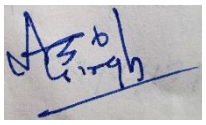
Managing river channels: channelization and flow regulation; impacts of water management on the physical, chemical and ecological condition of channels and floodplains, river restoration. Remote sensing and GIS applications in mapping, monitoring and management of fluvial environments.

Reading list

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.

Course Title: Natural Resource Management-III Course Code: MA/M.Sc./GEO/3/ DSC 9	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Basic understanding about concept of resource, environment and development.
CO2	Enrichment of knowledge about resource availability, accessibility and distribution.
CO3	Acquaintance with concepts of resource use, core-periphery relations and imbalanced development
CO4	Awareness about management techniques of resources for sustainable development.

UNIT-1

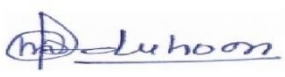
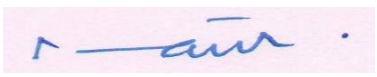
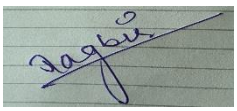
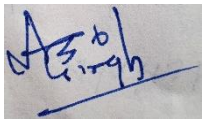
Concept and Scope of Resource Geography; Resource and ecosystem services: concept and types in relation to related concepts- environment, ecosystem, nature as nurture; World resources: classification of resources- changing profile and concerns; understanding relationship between natural resources and 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-2

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-3

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.

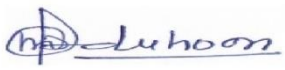
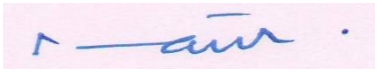
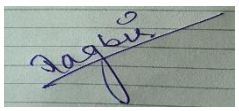
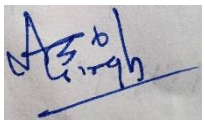





UNIT-4

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.

Reading list

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 Chattroj (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, McMillion, 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.

Course Title: Introduction to Remote Sensing (Practical)-III Course Code: MA/M.Sc./GEO/3/ SEC 3	Total Credits : 4 Time : 3 Hrs. Marks : 100 Lab work : 70 Viva voce : 20 File : 10

Note: For The Paper Setter

The question paper shall contain Ten questions in all. Candidate(s) are required to attempt any Five questions. All questions will carry equal marks.

Course Outcomes

CO1	Acquisition of skills of measurements on aerial photographs.
CO2	Capability of reading and interpreting physical and socio-economic features on photographs.
CO3	Acquaintance with different digital data products and software for the processing of satellite data.
CO4	Enhancement of skills about processing and extracting features from satellite imageries.

UNIT-1

Basic information on aerial photographs (annotation and markings). Identification of Fiducial marks, Principal point, Conjugate Principal points and Flight line. Calculation of scale of aerial photographs. Determination of height of objects on single vertical aerial photographs.

UNIT-2

Stereoscope vision and identification of objects on ZEISS card. Interpretation and preparation of land use/land cover from aerial photographs. Preparation of interpretation key of satellite imageries. Visual interpretation and preparation of land use/land cover from satellite imageries**.**

UNIT-3

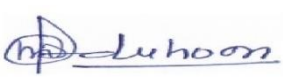
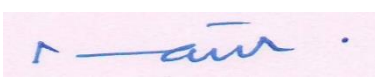
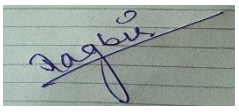
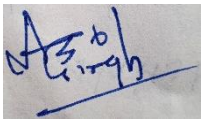
Georeferencing of Satellite Data by georeferenced toposheet or GCP's. Pre-processing of imageries (i) image enhancement (ii) sub set and (iii) resolution. merge/sharpening of image.

UNIT-4

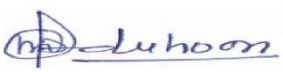
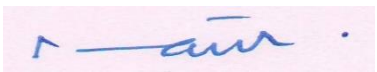
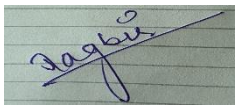
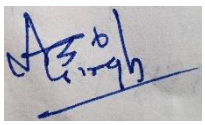
Preparation of FCC and comparison of features on true colour, panchromatic and FCC. Digital classification of satellite data (supervised and unsupervised).

Reading list

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.

MA/M.Sc. Geography
4th Semester

Course Title: Geographical Thought-IV Course Code: MA/M.Sc./GEO/4/ CC13	**Total Credits : 4** **Time : 3 Hrs.** **Marks : 100** **External : 70** **Internal : 30**

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Cognizance of nature and philosophy of geography.
CO2	Contextualization of development of geographic knowledge in ancient and medieval period.
CO3	Awareness about philosophy and concepts of modern geography.
CO4	Acquaintance with positivist and alternative explanations in geography

UNIT-1

Classification of knowledge, nature of geography and its place among sciences, Nature of geographic knowledge during ancient (Greek and Roman) and medieval (Arab) periods, Foundation of modern geography-contributions of Varenius, Kant, Humboldt and Ritter.

UNIT-2

Emergence of geography as a study of (i) physical features (ii) chorology (iii) landscapes. Concepts in geography: environmental determinism and possibilism, areal differentiation, Dichotomy and dualism in Geography: Physical vs Human Geography and Systematic vs Regional Geography.

UNIT-3

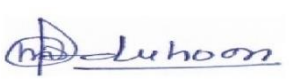
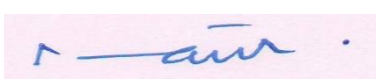
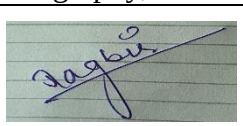
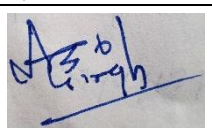
Quantitative revolution-emergence of geography as spatial science, Positivist explanations in geography- laws, theories, models, Inductive and deductive logic in geographic explanations.

UNIT-4

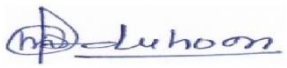
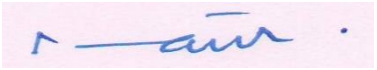
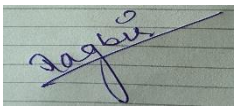
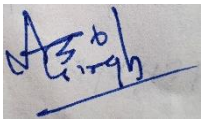
Behavioral and humanistic perspectives in geography, Social relevance in geography-Welfare, Radical and Feminist Perspectives, Postmodernism and Geography.

Reading list

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.

Course Title: Research Methodology-IV Course Code: MA/M.Sc./GEO/4/ CC14	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	To improve their ability and known about the research process and their problems.
CO2	With the help of this unit the students can improve their knowledge about research and formulated their research. They can generates hypothesis for research.
CO3	Data is an important part of any research. This unit help usto collect data for any research and give information about sampling techniques.
CO4	With the help of this unit any can understand the process of data collection and to improve the knowledge about questionnaire making.

UNIT-1

Introduction to Research in Geography: Meaning, Objectives, Types, and Significance of Research; Characteristics of research; The Research Process- a detailed description of steps involved; problems encountered by researchers in India.

UNIT-2

Defining the Research Problem: Meaning of research problem; Selection of research problem; Need for defining a research problem; Techniques involved in defining a problem; Limitations of the research problem.

Formulation of Hypotheses: Definition, characteristics and types of Hypothesis.

UNIT-3

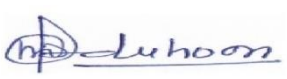
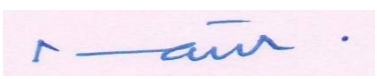
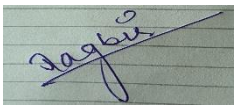
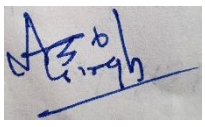
Research Design: meaning, need, and features of research design; Important concepts relating to research design; Types of research design-exploratory, descriptive and experimental. Samplingand Sample Design: Census and Sample Methods; basis, advantages and limitations of sampling; characteristics of a good sample; Sampling techniques and methods - random sampling methods and non-random sampling methods; Merits and limitations of sampling.

UNIT-4

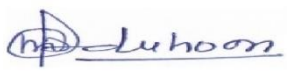
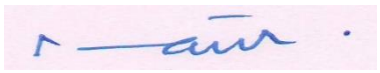
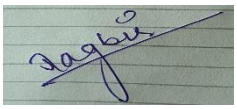
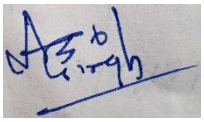
Data Sources and Data Collection**:** Types of Data-Primary and Secondary; Sources of data; Methods of collecting Primary Data - Observation method, Interview method, Questionnaire and Schedule; Difference between Questionnaire and Schedule.

Reading list

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.

Course Title: Fundamentals of Geographical Information System-IV Course Code: MA/M.Sc./GEO/4/ CC15	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Acquaintance with the fundamentals of Geographical Information Systems.
CO2	Capability to differentiate the data types in geographical information systems.
CO3	Understanding about the applications of geographical information systems in resource mapping.
CO4	Knowledge about types and functioning of global positioning system.

UNIT-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.

UNIT-2

Geographic data: spatial and non-spatial; spatial data structure: raster and vector; data base management system.

UNIT-3

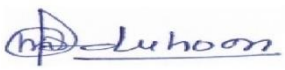
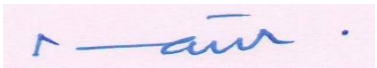
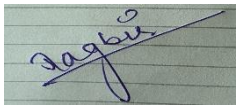
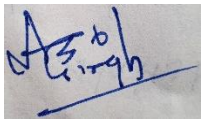
Spatial analysis: overlay, neighborhood and proximity; integration of raster and vector data; applications of GIS in resource mapping and management.

UNIT-4

Fundamentals of Global Positioning System (GPS): concept and principles; GPS devices; GPS system: NAVSTAR, GALILIO and GAGAN; applications of GPS.

Reading list

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.

Course Title: Cardinal Principles of Academic Integrity-IV Course Code: MA/M.Sc./GEO/4/ CC16	**Total Credits : 2** **Time : 2 Hrs.** **Marks : 50** **External : 30** **Internal : 20**

Note: For The Paper Setter

1. Five Questions will be set in all and students will be required to attempt 3 questions.
2. The first question will be compulsory and will consist of five short questions of 2 marks each covering the whole syllabus.
3. In addition, four more questions will be set unit-wise comprising of two questions from each unit. The candidates are required to attempt two more questions selecting at least one from each unit. (10 marks each).

Course Outcomes

CO1	Academic Integrity, Plagiarism (prevention and detection) and UGC regulations
CO2	Research and Publications ethics and best practices

UNIT-1

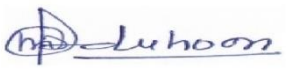
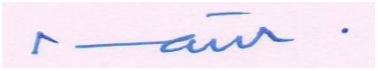
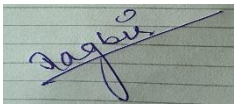
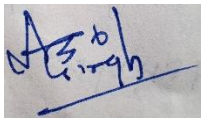
Academic Integrity: Introduction, Academic Integrity Values-Honesty and Trust, Fairness and Respect, Responsibility and Courage, Violations of Academic Integrity-types and consequences, Plagiarism -definition, Plagiarism arising out of misrepresentation-contract cheating, collusion, copying and pasting, recycling, Avoiding Plagiarism through referencing and writing skills, UGC Policy for Academic Integrity and prevention, Some Plagiarism detection tools.

UNIT-2

Research and Publication ethics: Scientific misconducts- Falsifications, Fabrication and Plagiarism (FPP), Publication ethics-definition, introduction and importance, Best practices/standard setting initiatives and guidelines-COPE, WAME etc., Violation of publication ethics, authorship and contributor-ship, Identification of publications misconduct, complains and appeals, Conflicts of Interest, Predatory publisher and journals.

Reading list

1. MacIntyre A (1967) A short History of Ethics, London Chaddah P (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized. ISBN: 978-9387480865
2. National Academy of Sciences, National Academy of Engineering and Institute of Medicine (2009) On being a Scientist: A guide to Responsible Conduct in research: Third Edition. National Academics press.
3. Resnik D. B. (2011) What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10.
4. Beall J (2012). Predatory publishers are corrupting open access, Nature, 489 (7415), 179. Indian National Science Academy (INSA), Ethics in Science Education, Research and Governance (2019). ISBN: 978-81-939482-1-7. UGC regulations (2018) for Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutes. Ulrike kestler, Academic Integrity, Kwantlen Polytechnic University.

Course Title: Aeolian Geomorphology-IV Course Code: MA/M.Sc./GEO/4/ DSC 10	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Study about inventory, distribution of water resources on earth, hydrological and its component.
CO2	Learn about methods of estimation of Water demand, problems related irrigation and Water quality parameters.
CO3	Know the Industrial use of water and Municipal use of water.
CO4	Understanding the Problems of water resource management, river water disputes, Conservation and planning for the development of water resources

UNIT-1

Aeolian Processes : Wind environment: introduction; desert wind systems; directional variability and resultant, Drift potential; scope of aeolian geomorphology. Grain in motion: fluid flows –flow types; interaction of the wind and the bed-wind shear; entrainment-lift and drag

UNIT-2

Aeolian Landforms: Wind erosion and landforms; processes: abrasion, deflation and aerodynamic erosion; landforms; yardangs, ventifacts, pans, stone pavements, deflation hollows, desert varnish: processes and significance. Dusts-sources; -contemporary and proximal, mineral composition; deposition; loess, types, palaeo-environmental significance.

UNIT-3

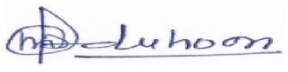
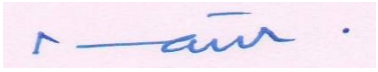
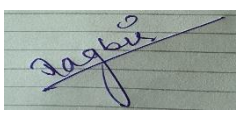
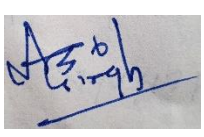
Depositional Processes and Palaeo Environment Forms of wind deposition: sand ripples, obstacle dunes; dune- classification schemes; morphodynamics of the crescentic, longitudinal and complex dunes. Aeolinites - composition and distribution.

UNIT-4

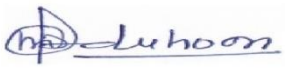
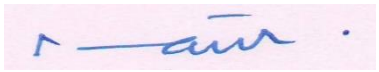
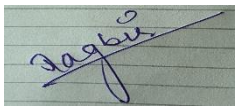
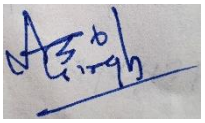
Applied Aeolian Geomorphology: Introduction; wind erosion on agricultural fields; controls of dust; Management of coastal dunes and dunes in semi -arid areas; desertification and its controls with special reference to India.

Reading list

1. Abrahams, A.D. and Parsons, A. J. (eds.). 1994. Geomorphology of Desert Environments. Chapman & Hall, London.
2. Goudie,A. and Hegde. 1980. Palaeo-geography and Pre-history of Indian Desert. AcademicPress, London.
3. Baumont, P. 1993. Drylands-Environment, Management and Development. Routledge, New York.
4. Bagnold, R.A. 1941. The Physics of Blown Sand and Desert Dunes. Methuen, London.

5. Cook, R. U.,Waren, A. and Goudie, A. 1993. Desert Geomorphology. London, UCL Press, London.
6. Embleton, C. and Thornes, J. (eds.). 1980. Process in Geomorphology. Arnold - Heinemann, New Delhi.
7. Greeley, R. and Iversen, J. D. 1985. Wind as a Geological Process. Cambridge University Press, Cambridge.
8. Lancaster, N. 1995. Geomorphology of Desert Dunes. Routledge, New York.

Course Title: Geography Of Water Resources-IV Course Code: MA/M.Sc./GEO/4/ DSC 11	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Study about inventory, distribution of water resources on earth, hydrological and its component.
CO2	Learn about methods of estimation of Water demand, problems related irrigation and Water quality parameters.
CO3	Know the Industrial use of water and Municipal use of water.
CO4	Understanding the Problems of water resource management, river water disputes, Conservation and planning for the development of water resources

UNIT-1

Water as a focus of geographical interest, inventory and distribution of world's water resources (surface and subsurface);Basic hydrological cycle and its components-precipitation, potential evapotranspiration, interception losses; runoff; Factors affecting water resources development – climatic factors, physiographic factors, geological factors.

UNIT-2

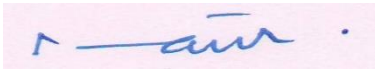
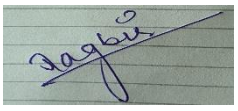
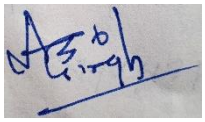
Water demand and use: methods of estimation — agricultural, industrial and municipal uses of water. Agricultural use of water: estimation of crop —water requirement; soil-water- crop relationships; water balance and drought; major and minor irrigation: methodsof distribution of water to farms; water harvesting techniques, soil water conservation.
Irrigation - water logging; salinity and alkalinity of soil - over exploitation of groundwater; land subsidence; saline water intrusion into the coastal aquifers; Waterquality parameters; water pollution-river and ground water-fluoride and arsenic

UNIT-3

Industrial use of water: methods of estimation; demand for water in the industrial sector of India. Municipal use of water: general trends in water supply to the urban and rural communities in India, Internal navigation, hydel power and recreation.

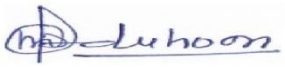
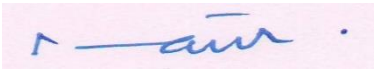
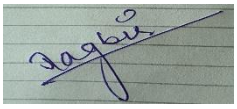
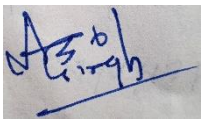
UNIT-4

Problems of water resource management; Floods - magnitude/frequency, structural and non-structural adjustment of flood hazards; embankments, reservoirs, channel improvement, soil conservation, afforestation, flood forecasting, evacuation, floodplains; land use regulation and insurance. Case studies of major floods. Droughts - occurrence, major drought management. Conservation and planning for the development of water resources-social and institutional considerations; integrated basin planning; conjunctive use of surface and groundwater resources; watershed management; international and inter-state river water disputes and treaties; some case studies.

Reading list

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.

Course Title: Soil Geography-IV Course Code: MA/M.Sc./GEO/4/ DSC 12	Total Credits : 4 Time : 3 Hrs. Marks : 100 External : 70 Internal : 30

Note: For The Paper Setter

1. Nine questions will be set in all and students will be required to attempt 5 questions.
2. Question No. 1 will be compulsory and will consist of 7 short answer type questions of 2 marks spread over the entire syllabus (2x7=14 marks)
3. For the remaining four questions, students will attempt 1 out of 2 questions from each of the four units (14 marks each).

Course Outcomes

CO1	Acquaintance with soil profile and soil forming processes
CO2	Enrichment of knowledge about physical, chemical and biological properties of soils
CO3	Awareness about soil erosion and degradation processes.
CO4	Augmentation of knowledge about soil conservation and soil survey methods.

UNIT-1

Nature and scope of soil geography,Soil formation factors (parent material, flora and fauna, climatic and topographic) and processes of soil formation and soil development (physical, biotic and chemical),Soil profile and its characteristics (zonal, azonal and intra zonal soils).

UNIT-2

Physical properties of soils: morphology, (texture, structure, colour, porosity and permeability), water, air and temperature, Chemical properties of soils: soils reaction and controlling factors, soil clays, organic matter and humus, Biological properties of soils (soil organisms).

UNIT-3

Soil classification: genetic, taxonomic and 7th Approximation, their characteristics and world patterns, Soil erosion and degradation processes.

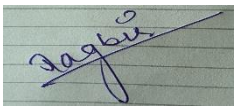
UNIT-4

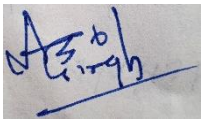
Conservation methods to improve the physical qualities of soils, Methods and mechanism of soil survey, Soil reclamation and management, integrated soil and management.

Reading list

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.





Course Title: Fundamentals of Geographical Information Systems (Practical)-IV Course Code: MA/M.Sc./GEO/4/ SEC 1	Total Credits : 4 Time : 3 Hrs. Marks : 100 Lab work : 70 Viva voce : 20 File : 10

Note: For The Paper Setter

The question paper shall contain Ten questions in all. Candidate(s) are required to attempt any Five questions. All questions will carry equal marks.

Course Outcomes

CO1	Acquisition of skills to handle geographical information systems software.
CO2	Enhancement of skills in processing of digital imageries using techniques of GIS.
CO3	Awareness about GPS functioning and processes of data acquisition.
CO4	Acquaintance with the techniques of integrating GPS data in GIS and mobile mapping.

UNIT-1

Familiarization to Geographic Information System; Open sources software; Generation of geographic framework: Georeferencing of Topographic maps with Projection, False Colour Composition.

UNIT-2

Generation of geodatabase/ spatial data base: vectorization (point, line and polygon), editing and building topology, joining non-spatial data.

UNIT-3

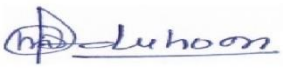
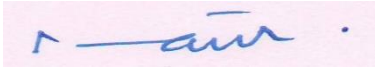
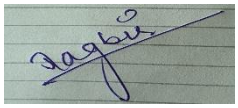
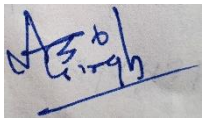
Analysis: overlay, query, proximity and buffering (Simple and Multi ring buffer).

UNIT-4

Map preparation and Symbolization: chorochromatic, choropleth and point proportional.
GPS: introduction to the GPS and different pages in GPS device. Collection of GCP and r mapping.

Reading list

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.

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. MA/GEO/1/CC1.1 and MA/GEO/1/CC1.2)** of a course with equal weightage given to both COs. Similarly, class test-II is based on next two COs (i.e. **MA/GEO/1/CC1.3 and MA/GEO/1/CC1.4**) 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. **MA/GEO/1/CC1.1.**
(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. **MA/GEO/1/CC1.2.**
(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. **MA/GEO/1/CC1.3.**
(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. **MA/GEO/1/CC1.4.**
(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 by 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:

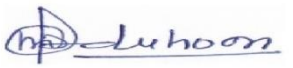
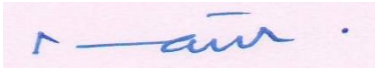
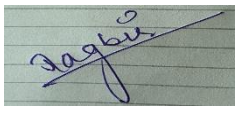
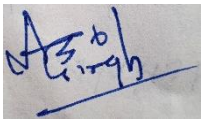
The overall CO attainment level of a course can be obtained as:

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.

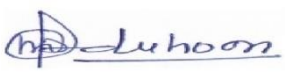
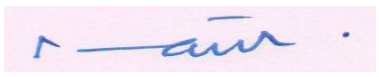
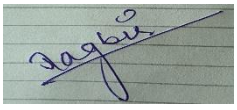
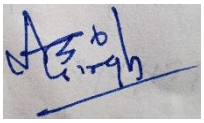
Attainment of POs:

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 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
MA/GEO/1/CC1											
MA/GEO/1/CC2											
MA/GEO/1/CC3											
MA/GEO/1/CC4											
MA/GEO/1/DSC 1											
MA/GEO/1/DSC 2											
MA/GEO/1/DSC 3											
MA/GEO/1/DSC 4											
MA/GEO/1/SEC 1											
MA/GEO/1/SEC 2											
MA/GEO/2/CC5											
MA/GEO/2/CC6											
MA/GEO/2/CC7											
MA/GEO/2/CC8											
MA/GEO/2/DSC 5											
MA/GEO/2/DSC 6											
MA/GEO/9/OEC 1											
MA/GEO/9/OEC 2											
MA/GEO/3/CC9											
MA/GEO/3/CC10											
MA/GEO/3/CC11											
MA/GEO/3/CC12											
MA/GEO/3/DSC 7											
MA/GEO/3/DSC 8											
MA/GEO/3/DSC 9											
MA/GEO/3/SEC 3											
MA/GEO/9/OEC 3											
MA/GEO/4/CC13											
MA/GEO/4/CC14											
MA/GEO/4/CC15											
MA/GEO/4/CC16											
MA/GEO/4/DSC 10											
MA/GEO/4/DSC 11											
MA/GEO/4/DSC 12											
MA/GEO/4/SEC 4											
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 MA/GEO/1/CC1 -PO1 Cell:

PO1 attainment value = (Mapping factor of **MA/GEO/1/CC1** -PO1 from **Table 3** × Overall CO attainment value for the course **MA/GEO/1/CC1**)/3

For M-GEO-201-PO1 Cell:

PO1 attainment value = (Mapping factor of **M-GEO-201**-PO1 from **Table 3** × 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.

	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			

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 × average attainment value for PO1 using direct method **(from above table)** + 0.2 × 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:

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.