



ROYAL GLOBAL UNIVERSITY
— GUWAHATI —

**ROYAL SCHOOL OF ENVIRONMENTAL AND EARTH
SCIENCES
(RSEES)**

DEPARTMENT OF GEOGRAPHY

M.A/M.Sc. in Geography

Postgraduate Programme as per NEP, 2020

W.E.F

AY - 2025- 26

STRUCTURE OF THE SYLLABUS FOR 2 YEAR PG PROGRAMME

SCHOOL NAME - Royal School of Environment and Earth Sciences (RSEES)
DEPARTMENT NAME - Department of Geography
PROGRAMME NAME - M.A./ M.Sc. Program

1st SEMESTER				
COURSE CODE	COURSE TITLE	LEVEL	CREDIT	L-T-P
GEO164C101	Advanced Geomorphology	400	4	4-0-0
GEO164C102	Advanced Climatology	400	4	4-0-0
GEO164C103	Statistical Techniques in Geography	400	4	4-0-0
GEO164C104	Cartographic Techniques	400	4	4-0-0
GEO164C115	Practical - I	400	4	0-0-8
	Swayam Course (Upcoming)	400	3/4	
TOTAL CREDIT FOR 1st SEMESTER			20+3/4	
2nd SEMESTER				
COURSE CODE	COURSE TITLE	LEVEL	CREDIT	L-T-P
GEO164C201	Economic Geography	400	4	4-0-0
GEO164C202	Evolution of Geographical thought	400	4	4-0-0
GEO164C203	Geography of Rural Development	400	4	4-0-0
GEO164C204	Urban Geography	400	4	4-0-0
GEO164C215	Practical-II	400	4	0-0-8
	Swayam Course (Upcoming)	400	3/4	
TOTAL CREDIT FOR 2nd SEMESTER			20+3/4	
TOTAL CREDIT FOR YEAR 1= 46/48				
3rd SEMESTER				
COURSE CODE	COURSE TITLE	LEVEL	CREDIT	L-T-P
GEO164C301	GIS, GPS: Principles and applications	500	4	4-0-0
GEO164C302	Principles of Remote Sensing	500	4	4-0-0
GEO164C303	Research Methodology in Geography	500	4	4-0-0
GEO164C304	Disaster Management	500	4	4-0-0
GEO164C325	Report writing on Environmental issues	500	4	4-0-0
TOTAL CREDIT FOR 3rd SEMESTER			20	
or 3rd Semester (For students with 3rd & 4th Semester Research)				
GEO164C321	Research Project Phase - 1		20	
Course Work with Research, (Course Work=12 Credit, Research=8 Credits)				
COURSE CODE	COURSE TITLE	LEVEL	CREDIT	L-T-P
GEO164C301	GIS, GPS: Principles and applications	500	4	4-0-0
GEO164C302	Principles of Remote Sensing	500	4	4-0-0
GEO164C303	Research Methodology in Geography	500	4	4-0-0
GEO164C324	Research Project (Minor)	500	8	
	Total		20	

4th SEMESTER				
COURSE CODE	COURSE TITLE	LEVEL	CREDIT	L-T-P
GEO164C401	Geography of Population and Gender	500	4	4-0-0
GEO164C402	Environment and Sustainable Development	500	4	4-0-0
GEO164C403	Biodiversity Conservation	500	4	4-0-0
GEO164C404	Geography of Tourism	500	4	4-0-0
GEO164C425	Report Writing on Socio-Economic Issues	500	4	
Or 4th Semester (For students with 3rd & 4th Semester Research)				
GEO162C421	Research Project Phase - 2 Dissertation only (for students who have completed only coursework of 20 credits in 3 rd semester/for 'Coursework only' in lieu of research)	500	20	
Course Work with Research, (Course Work=8 Credit, Research=12 Credits)				
GEO164C401	Geography of Population and Gender	500	4	4-0-0
GEO164C404	Environment and sustainable Development	500	4	4-0-0
GEO164C426	Research (Major)	500	12	
Total Credit for 4 th Semester			20	
TOTAL CREDIT FOR YEAR 2 = 40				

M.A./M. Sc. Course in Geography: Semester-I

Paper I Core Course	ADVANCED GEOMORPHOLOGY	Subject Code:
	L-T-P-C: 4-0-0-4 Credit Units: 4 Scheme of Evaluation: (T)	GE0164C 101

Course Objectives: *The pivotal point of this course is to make students familiar with the fundamental concepts of geomorphology which incorporates the topics related to geomorphic structure and processes, earth's interior and composition, evolution of landforms and so on.*

Course Outcomes:

By the end of this course the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
C01.	Recall the principles, basic concepts of Geomorphology and its recent trends.	BT 1
C02.	Outline the roles of structure, process, and time in shaping the landforms along with interpreting geomorphological maps.	BT 2
C03.	Apply the knowledge in geographical research.	BT 3
C04.	Distinguish between the mechanisms that control these processes and also analyse how the natural and anthropogenic operating factors affect the development of landforms.	BT 4
C05.	Evaluate the functioning of Earth systems in real time.	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Advanced Concepts in Process Geomorphology: System dynamics and feedback mechanisms, Rate laws and equilibrium concepts; Weathering Processes and Rates: Chemical and Physical weathering processes; Multicyclic & Polygenetic Evolution of Landscape, Concept of threshold.	12
Unit 2	Plate Tectonic: Concepts of related views; Earth movements: Epeirogenesis, orogenesis, isostasy; Forces of crustal instability: Earthquake and Vulcanicity; Evolution of Landforms: Fluvial Landforms, Drainage Pattern Evolution; Karst Landforms: Erosional and Depositional Features.	12
Unit 3	Glacial and Periglacial dynamics and erosion processes, Glacial landform development; Coastal Landform evolution: Processes and Features; Aeolian processes and landforms, Drainage systems in arid regions; Climate change impacts.	12
Unit 4	Remote Sensing in Geomorphology; Geomorphological Hazards: Landslide, Flood analysis and prediction, Coastal erosion, Risk assessment; Human impacts on landscapes; Restoration approaches and techniques, Case Studies.	12
	Total	48

Text Books:

1. Hart, M. G. (1986): Geomorphology Pure and Applied, George Allen & Unwin, London
2. Dayal, P. (2nd edition), (1996): A Textbook of Geomorphology, Shukla Book Depot, Patna
3. Savindra Singh (Rep. 2011): Geomorphology, Prayag Pustak Bhawan, Allahabad.
4. Strahler A. H and Strahler, A. N. (1992): Modern Physical Geography, John Wiley, New York.
5. Thornbury, W. D. (Rep.2011): Principles of Geomorphology, John Wiley and Sons, New York.

Reference Books:

1. Ahmad, E., 1985: Geomorphology, Kalyani Publishers, New Delhi
2. Derbishire, E. (ed), 1976: Geomorphology and Climate, Wiley, London.
3. Fairbridge, R.W. (ed), 1968: Encyclopedia of Geomorphology, Reinhold, New York
4. Gregory, K, J. and Walling, D.E., 1973: Drainage Basin- Form and Process, Edward Arnold, London
5. Goudie, Andrew, et. Al. (eds), 1981: Geomorphological Techniques, George Allen & Unwin, London.
6. Kale, V. S. and Gupta, A. (Rep.2011): Introduction to Geomorphology, Orient Longman, Calcutta.
7. Ollier, C. D. (1981): Tectonics and Landforms, Longman, London.
8. Spark B.W. (1972): Geomorphology, Longman, New York.
9. Young, A. (1972): Slope, Longman, New York, Oliver and Boyd, Edinburgh

Paper II Core Course	ADVANCED CLIMATOLOGY		Subject Code: GEO164C102
	L-T-P-C: 4-0-0-4	Credit Units: 4	

Course Objectives: *The course aims to illustrate the atmospheric elements, processes and resultant weather and climates, the impact of climates on planet earth and its associated processes.*

Course Outcomes:

By the end of this course the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
C01.	Define the elements of weather and climate and its impacts at different scales.	BT 1
C02.	Demonstrate and interpret weather maps.	BT 2
C03.	Develop the climatic aspects and its bearing on planet earth.	BT 3
C04.	Distinguish world climatic regimes.	BT 4
C05.	Assess the monsoon and its vagaries, global climate change and its consequences.	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	The field of Climatology and its subdivisions, Factors affecting weather and climate, Composition and vertical structure of the atmosphere- physical properties, chemical composition and temperature changes; Insolation, factors affecting insolation, latitudinal and seasonal variation of insolation and the heat budget.	10
Unit 2	Horizontal and Vertical distribution of temperature, Inversion of temperature, Pressure measurement and units, Factors affecting air pressure, Pressure changes with altitude, Observed distribution of surface pressure, Wind observation and measurement, Factors affecting wind, Geostrophic wind, Gradient wind, Pressure systems and air circulation, Models of general circulation, Local winds and Jet stream	14
Unit 3	Air mass and fronts: types, characteristics and their influence on weather and climate, Factors affecting evaporation, atmospheric lapse rate (Normal, environmental, dry and wet adiabatic) and stability (absolute stability, absolute instability, conditional instability); Changes of state of water, factors affecting condensation; Classification of world climate of Koppen and Thornthwaite	10
Unit 4	Monsoon climate: origin, mechanism of development and distribution. Climatic disturbances: cyclone, anticyclone, drought, cloud burst, el-nino; Techniques of weather forecasting, Causes of global warming and climate change - natural and anthropogenic (industrial and vehicular emissions of Green House Gases, Radiation patterns); Global precipitation and temperature distribution patterns; Extreme climatic events and processes; Urban heat island formation, concept of micro-climate in urban context El Nino and La Nina effects; Consequences of climate change in various geographical regions, concept of urban green space	14
	Total	48

Text Books:

1. Barry, R. G. and Chorley, R. J. (1971): Atmosphere, Weather and Climate, Methuen Co. Ltd, London.
2. Critchfield, H. J. (Rep.2010): General Climatology, Prentice Hall, New Delhi.
3. Lal, D. S. (2003): Climatology, Sharda Pustak Bhawan, 11 , University Road, Allahabad-211002
4. Rob Vandenburg (2009): Evaluating Climate Change and Development.
5. Singh, S. (Rep.2011): Climatology, Prayag Pustak Bhawan, Allahabad

Reference Books:

1. Lutgens F. K., Tarbuck E. J. and Tasa D., (2009): The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey
2. Oliver J. E. and Hidore J. J., (2002): Climatology: An Atmospheric Science, Pearson Education, New Delhi.
3. Stringer, E. N., 1982: Hoirn, L. A., (1980): An Introduction to Climate, International Series.
4. Trewartha, G. T. and Horn, L. A., (1980): An Introduction to Climate, International Series.
5. Weiesner, C. J.: Hydrometeorology, Chapman & Hall Ltd.

Paper III Core Course	STATISTICAL TECHNIQUES IN GEOGRAPHY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GE0164C1 03

Course Objectives: *This paper provides an understanding of the pure and applied nature of Geography along with the key elements in the discipline.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO1.	Define the statistical methods and quantitative techniques used in Geography.	BT 1
CO2.	Interpret various methods and techniques of data collection, data tabulation, data interpretation and analysis.	BT 2
CO3.	Identify the importance of data in geography.	BT 3
CO4.	Analyse data through tabulation, sample size and other methods by handling data in the field.	BT 4
CO5.	Interpretation of data and validation of hypothesis	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Quantitative and qualitative techniques; Significance and limitations of quantitative techniques; Descriptive and inferential statistics; Levels of measurement; Data sources and acquisition techniques; Sample and sampling techniques; Geographic data matrix.	12
Unit 2	Measures of central tendencies (Mean, Median and Mode); Measures of dispersion (Range, Quartile Deviation, Mean Deviation, Standard Deviation; Coefficient of variation); Concept of spatial mean and median centres and standard distance and its uses, Nearest Neighbour Analysis (NNA), Inferential statistics – Chi-square (c^2) Analysis, Concept of ANOVA and F-test;	12
Unit 3	Correlation and regression analysis (simple and multiple), Regression residual mapping, Parametric tests - t -test; Nonlinear relationships - Exponential and power function types; Theoretical distributions: Normal, Poisson and Binomial.	12
Unit 4	Basics of matrix algebra: Matrices - definition, types; minors and co-factors, determinant of a square matrix, inverse, adjoint, solutions of linear equations; Linear algebra in developing multivariate regression models;	12
Total		48

Note: Computer / calculator based compulsory home assignments may be given for various units. Scientific calculator may be permitted in the examination hall for this paper.

Text Books:

1. Gregory, S., 1978: Statistical Methods and the Geographer, Longman, London.
2. Hammond R and P. S. McCullagh, 1974: Quantitative Techniques in Geography: An Introduction, Clarendon Press, Oxford.
3. Johnston R. J., 1973: Multivariate Statistical Analysis in Geography, Longman, London.
4. King, L. J., 1969: Statistical Methods in Geographical Studies, London.
5. Mahmood, A., 1977: Statistical Methods in Geographical Studies, Concept Publications, Delhi.
6. Maurice Yeats, 1974: An Introduction to Quantitative Analysis in Human Geography, McGraw, Hill, New York.
7. Paul, S. K., 1998: Statistics for Geoscientists, Tata McGraw Hill, New Delhi.

8. Robinson, G. M., 1998: Methods and Techniques in Human Geography, John Wiley & Sons, Chichester.
9. Sarkar, A. 2013: Quantitative Geography: Techniques and Presentations. Orient BlackSwan Private Ltd., New Delhi

Reference Books:

1. David Unwin, 1981: Introductory Spatial Analysis, Methuen, London.
2. John P.Cole and Cuchlaine A. M. King, 1968: Quantitative Geography, John Wiley, London.
3. Koutsoyiannis, 1973: Theory of Econometrics, Mcmillan, London.
4. Peter Haggett, Andrew D. Cliff, & Allan Frey, 1977: Location Methods Vol. I and II, Edward Arnold, London.
5. Taylor P.J., 1983: Quantitative Methods in Geography: An Introduction to Spatial Analysis, Waveland Press, Boston Publishers.

Paper IV Core Course	CARTOGRAPHIC TECHNIQUES			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164C104

Course Objectives: *This course focuses to make the students understand the science and art of map-making along with clearing the basics of map and map scale and its varied types along with the diagrammatic representation of geographical data.*

Course Outcomes:

By the end of this course the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO1.	Define about map and its types, map scale and profile mapping.	BT 1
CO2.	Interpret different projection systems and digital mapping analysis.	BT 2
CO3.	Construct graphs/charts, cartograms and thematic maps based on socio-economic, cultural and climatic data.	BT 3
CO4.	Conclude the importance of maps for regional development and decision-making.	BT 5
CO5.	Evaluate different aspects of surveying and levelling using varied techniques and equipment.	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Cartography: The science and art of map making; Nature and scope of Cartography; Earth as a cartographic problem, Scales, Coordinate systems, distance and directions in maps; Developable and developed surfaces - types and properties; Map projection systems and types; Importance of cartography in geography; Digital cartography- data sources for digital mapping and analysis.	10
Unit 2	Map Projection: Basic concepts, classification, basic Principles of construction of zenithal, conical and cylindrical groups of map projections and choice of map projections.	14
Unit 3	Principles of mapping and base map preparation; Concept of generalization; Map design and layout; Thematic map and its classes; Choropleth and isopleth maps; Map reading and analysis; Representation of socio-economic and climatic data	12
Unit 4	Basic idea of geodetic and plane surveying; Principles and techniques of surveying by: Plane Table, Prismatic Compass, Transit Theodolite, Levelling by Dumpy Level / Auto level, Total Station (Introductory idea)	12
	Total	48

Text Books:

- Misra, R. P., et al., 2014: Fundamentals of Cartography, Concept Publishing co. New Delhi
- Monkhouse, F. J., and Wilkinson, H. R., 1989: Maps and Diagrams, B. I., Publications Pvt. Ltd., New Delhi-59
- Robinson, A. H., et al., 1995: Elements of Cartography, 6th Edition, John Wiley & Sons, New York.
- Steers, J. A., 1965: An Introduction to the Study of Map Projection, University of London, London.
- Talukder, S., 2008: Introduction to Map Projections, EBH Publishers (India), Guwahati.

Reference Books:

- Cuff, D. J. and Mattson, M. T., 1982: Thematic Maps: Their Design and Production, Methuen, New Work
- Singh, R. L.: Elements of Practical Geography, Kalyani Publishers, New Delhi.
- Sing, R. L. and Singh Rana, P. B., 1998: Elements of Practical Geography, Kalyani Publishers, New Delhi.
- Saha, P. K. and Basu, P., 2010: Advanced Geography Practical – A Laboratory Manual, Books and Allied (P) Ltd., Kolkata.

Paper V Core Course	PRACTICAL - I			Subject Code:
	L-T-P-C: 0-0-8-4	Credit Units: 4	Scheme of Evaluation: (P)	GEO164C115

Course Objectives: *The course aims at increasing the practical knowledge of the students.*

Course Outcomes:

By the end of this course the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO1.	Define the principles and concepts involved in Practical Geography.	BT 1
CO2.	Classify the nature, characteristics, and sources of geospatial data.	BT 2
CO3.	Develop the skills and technical capabilities of the students.	BT 3
CO4.	Simplify the application of the concepts related to Geomorphology, Climatology and Population Geography.	BT 4
CO5.	Inspect geospatial tools and technologies to create and analyse geospatial data for natural resource assessments, planning and management related applications.	BT 4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Analysis of Slope by Wentworth's method - 1 Exercise , Profile drawing (Serial, Superimposed, Composite, Projected) - 2 Exercises , Drainage basin delimitation, Ordering of streams, calculation of bifurcation ratio, length ratio, drainage frequency and density, computation of basin circularity ratio- 1 exercise	4
Unit 2	Verification of law of drainage morphometry - 3 Exercises , drawing of Hypsometric curve and computation of Integral - 1 Exercise	4
Unit 3	Preparation of rainfall variability map (Assam and Rajasthan) - 2 Exercises , drawing of hythergraph, climograph and ergograph - 3 Exercises , rainfall frequency analysis, rainfall dispersion graph, water deficiency and surplus graph- 2 Exercises , weather chart interpretation- 1 Exercise	8
Unit 4	Mapping of Population distribution, density and concentration in the World and India, Population growth trend and projection in the World and India, Population-Resource regions in the world- 9 Exercises	8
	Total	24

Reference Books:

1. Weiesner, C. J.: *Hydrometeorology*, Chapman & Hall Ltd.
2. Gregory, K, J. and Walling, D.E., 1973: Drainage Basin- Form and Process, Edward Arnold, London
3. Goudie, Andrew, et. Al. (eds), 1981: Geomorphological Techniques, George Allen & Unwin, London.
4. Woods, R., 1979: *Population Analysis in Geography*, Longman, London.

M.A./M. Sc. Course in Geography: Semester-II

Paper I Core Course	ECONOMIC GEOGRAPHY	Subject Code:
	L-T-P-C: 4-0-0-4 Credit Units: 4 Scheme of Evaluation: (T)	GEO164C201

Course Objectives: It focuses on the basic concepts of economic geography and its associated patterns and processes of the prime economic activities of the world.

Course Outcomes:

By the end of this course the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO1.	Define concepts and ways on how geographical aspects organise economic space.	BT 1
CO2.	Compare different sectors of economy and arrive at logical conclusion regarding importance of each sector in economic development of the nation.	BT 2
CO3.	Identify the principles and significance of economic geography.	BT 3
CO4.	Discover new insights among students on the relevance of economy and geography and associated problems in contemporary times.	BT 4
CO5.	Appraise the regional variation in the economic scenario and distribution pattern of resources.	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Nature and scope of Economic Geography, its evolution and theoretical development; Approaches in Economic Geography, Types of economic activities and factors of location influencing the activities	10
Unit 2	Economic Geography of Agriculture, Place of agriculture in global economy, Agricultural System and Regions of the World and India, Types of agriculture, Concept of crop combination and its methods of delineation (Weaver, Doi and Rafiullah), diversification and rotation, Von Thunen Model of Land Use Planning.	14
Unit 3	Classification of Industries, Factors of Industrial location, , Theories of Industrial Location- A. Weber, E.M. Hoover, A. Losch, A. Pred and D. M. Smith, Industrial Regions: World and India, Industrial Development experience in India and Japan, World Distribution of ICT (Information and Communication Technology) .	10
Unit 4	Economic Geography of Resources; its global pattern of distribution and production: water, coal, petroleum, forest and nuclear, International trade of Food grains and cash crops, Special Economic Zones, Theories of development: Myrdal and Rostow, Level of economic development on global perspective.	14
	Total	48

Text Books:

- Alexander J. W., 1963: Economic Geography, Prentice-Hall Inc., Englewood Cliffs, New
- Coe, N. M., Kelly, P. F., & Yeung, H. W. (2019). *Economic geography: a contemporary introduction*. John Wiley & Sons.
- Combes P., Mayer T. and Thisse J. F., 2008: Economic Geography: The Integration of Introduction, Wiley-Blackwell.
- Hodder B. W. and Lee Roger, 1974: Economic Geography, Taylor and Francis.

Reference Books:

1. Gunnar Alexanderson, 1988: *Geography of Manufacturing*, Prentice-Hall Inc, (E.E. Edition)
2. Isard, W., 1956: *Location and Space Economy*, MIT Press, Cambridge.
3. Losch, A., 1954: *The Economics of Location*, New Haven.
4. Smith, David M., 1981: *Industrial Location: An Economic Geographical Analysis*, Wiley, New York
5. Symons, L., 1979: *Agricultural Geography*, West view Press, Colorado
6. Thomas, R. S. and Corbin, P. B., 1974: *The Geography of Economic Activity*, McGraw Hill, New York

Paper II Core Course	EVOLUTION OF GEOGRAPHICAL THOUGHT			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164C202

Learning objective: The objective of this course is to make the student look into the chronology of development of the subject of geography through contribution of varied scholars, approaches and schools, major themes and components of geography.

Learning Outcomes:

After successful completion of the course the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO 1.	Define the various parameters and components of Geography.	BT 1
CO 2.	Interpret the chronological development of the subject of geography.	BT 2
CO 3.	Identify the contributions made by the schools of geography.	BT 3
CO 4.	Discover the physical and humanistic perspective and its dimensions in Geography in relation to the physical and cultural surrounding	BT 4
CO 5.	Explain the various issues of real world with a geographical perspective	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Place of geography in the classification of knowledge: Defining the field of geography, relation of geography with other natural and social sciences; Geography as the study of areal differentiation and spatial organisation; Defining the field of human geography, reactions to nomothetic and ideographic approaches	12
Unit 2	Geography through the ages; general character of geographic knowledge during the ancient and mediaeval period; impact of discoveries and European renaissance on the emergence of modern geography, Foundations of modern geography: Contribution of German (Humboldt, Ritter, Ratzel), French (Paul Vidal de la Blache), British and American geographers.	12
Unit 3	Evolution of geographic thought (Determinism- the impact of Darwinism, Possibilism, Human Ecology, Morphology of Landscape), , Areal differentiation) and their impact in the development of the field, Post Structuralism and Post Colonialism	10
Unit 4	Positivism and quantitative revolution, behaviouralism, radicalism, humanism and post-modernism, locational analysis, Explanation in geography: laws and theories; models and system analysis, Spatial analysis: history and concept of space and spatial organisation, gender geography and post modernism geography	14
	Total	48

Text Books:

1. Adhikari, S., 1992: Geographical Thought, Chaitanya Pub. House, Allahabad.
2. Berry, B. J. L., 1973: 'A Paradigm for Modern Geography', in R. J. Chorley (ed), Directions in Geography, London Methuen.
3. Bunge, W., 1962: Theoretical Geography, Lund Studies in Geography, Lund, C.W.K. Gleerup.
4. Buttimar, A., 1978: 'On People, Paradigms and Progress in Geography', in D.R. Stoddart (ed),
5. Geography, Ideology and Social Concern, Oxford, Blackwell.
6. Dickinson, R. E., 1969: Makers of Modern Geography, Routledge and Kegan Paul, London.

Reference Books:

1. Dikshit, R. D., 1997: Geographical Thoughts: A Contextual History of Ideas, Prentice Hall of India, New Delhi.

2. Gold, J. R., 1980: *An Introduction to Behavioural Geography*, Oxford University Press.
3. Hartshorne, R., 1939: *The Nature of Geography*, Association of American Geographers, Lancaster, Penn.
4. Hartshorne, R., 1959: *Perspective on the Nature of Geography*, Rand Mckully, Chicago.
5. Harvey, D., 1969: *Explanation in Geography*, St. Martin's Press, New York.
6. Harvey, Milton and Holly, Brian P.1989: *Themes in Geographic Thought*, Routledge, London.
7. James, P. E., 1972: *All Possible World: A History of Geographic Ideas*, The Odyssey Press, New York.

Paper III Core Course	GEOGRAPHY OF RURAL DEVELOPMENT			Subject Code: GE0164C203
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	

Course Objectives: *The course aims to make students aware of the concepts, approaches and planning process related to rural development in India, along with understanding the rural economic base, rural development process and provision of services in rural areas.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
CO. No.	Course Outcome	Blooms Taxonomy Level
C01	Define the need and approaches to rural development.	BT1
C02	Interpret in detail about the rural economic base especially about the significance of development of non-farm sector in rural areas.	BT2
C03	Develop in-depth knowledge of pre and post-independence period of rural development.	BT3
C04	Analyze the relevance of access to services like health, education in rural areas	BT4
C05	Interpret the various types of data along with critical evaluation .	BT5
C06	Design and develop a detail project report	BT6

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Rural Development: meaning and dimensions; Need for Rural Development studies in geography; Rural Poverty; Rural development in India: Role of Zilla Parishad and Panchayats in Rural Development, Rural Finances – Banks, NABARD etc.	10
Unit 2	Concept of Village, Rural Settlement pattern, Rural Economic Base: Panchayati raj System, Agriculture and Allied Sectors, Seasonality and Need for Expanding Non-Farm Activities, Co-operatives	14
Unit 3	The Problem of Housing, housing types, low cost houses, the housing schemes in rural area, Dimensions of Rural unemployment and under employment; Rural – Urban migration issues.	10
Unit 4	Sustainable Rural Development programmes in India: Drought Prone Area Programmes, Hill Area Development Programme, PMGSY, DDU-GKY, MGNREGA, Jan Dhan Yojana, DAY-NRLM, NHM, Samagra Sikhsa Abhiyan	14
Total		48

Text Book:

- Gilg A. W., 1985: An Introduction to Rural Geography, Edwin Arnold, London.
- Krishnamurthy, J. 2000: Rural Development - Problems and Prospects, Rawat Publs., Jaipur
- Lee D. A. and Chaudhri D. P. (eds.), 1983: Rural Development and State, Methuen, London.
- Misra R. P. and Sundaram, K. V. (eds.), 1979: Rural Area Development: Perspectives and Approaches, Sterling, New Delhi.

References:

- Robb P. (ed.), 1983: Rural South Asia: Linkages, Change and Development, Curzon Press.
- UNAPDI 1986: Local Level Planning and Rural Development: Alternative Strategies. (United Nations Asian & Pacific Development Institute, Bangkok), Concept Publs. Co., New Delhi.
- Wanmali S., 1992: Rural Infrastructure Settlement Systems and Development of the Regional Economy in South India, International Food Policy Research Institute, Washington, D.C.
- Yugandhar, B. N. and Mukherjee, Neela (eds.) 1991: Studies in Village India: Issues in Rural Development, Concept Publs. Co., New Delhi.

Misra, R. P. (ed.), 1985: Rural Development: Capitalist and Socialist Paths, Vol. 1, Concept, New Delhi

Paper IV Core Course	Urban Geography		Subject Code: GE0164D204
	L-T-P-C: 4-0-0-4	Credit Units: 4	

Course Objectives: *The course aims to give the idea of the concept of urban geography and its major aspects as well as it seeks to develop new insights among the students on the relevance of urban geography and its associated problems in a rapidly urbanizing world.*

Course outcomes:

After successful completion of the course, the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO1.	Define concepts related to urban geography and its approaches.	BT 1
CO2.	Explain different geographical factors which organise urban spaces and develop ideas in its relation.	BT 2
CO3.	Identify the new insights on the relevance of urban geography.	BT 3
CO4.	Discover and develop skills seeking advanced studies on urban planning and development.	BT 4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Urban Geography: Meaning, subject matter and scope; approaches and trends in urban geography. Towns: Types, characteristics, origin and growth in global and national contexts, Functional classification of towns; Schemes of city classification	10
Unit 2	Patterns of Urbanization in developed and developing countries; Components of urbanization and urban population growth, Urban morphology and land use structure; Theories on the internal structure of town: the Sector Theory of Homer and Hoyt, and the Multiple Nuclei Theory of Harris and Ullman	14
Unit 3	Concept of city-region, urban agglomeration, urban sprawl, Umland and periphery, rural-urban dichotomy and continuum, urban fringe, satellite town, new town, smart city. Urban Systems: Concept of urban system and hierarchy; Christaller's Central Place Theory; the rank-size distribution of cities; concept of primate city.	14
Unit 4	Urban issues and problems: Housing, slums, civic amenities (transportation and drinking water), traffic congestion, pollution (air, noise, water), and crime. Urbanization and urban development planning in India: Trend and regional patterns of urbanization; national urban development policies and programmes; emerging urban issues of selected cities (Delhi NCR, Mumbai, Guwahati).	10
Total		48

Text Book:

1. Bansal, S.C. (2010): Urban Geography, Meenakshi Prakashan, Meerut.
2. Hall T., 2006: Urban Geography, Taylor and Francis.
3. Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: Urban Geography, John Wiley.

4. Knox P. L. and McCarthy L., 2005: Urbanization: An Introduction to Urban Geography, Pearson Prentice Hall New York.
5. Pacione M., 2009: Urban Geography: A Global Perspective, Taylor and Francis.

References:

1. Bala, R. (1986): Urbanisation in India, Rawat, Jaipur.
2. Fyfe N. R. and Kenny J. T., 2005: The Urban Geography Reader, Routledge.
3. Graham S. and Marvin S., 2001: Splintering Urbanism: Networked
4. Infrastructures, Technological Mobilities and the Urban Condition, Routledge
5. Knox P. L. and Pinch S., 2006: Urban Social Geography: An Introduction, Prentice Hall
6. Kundu, A. (1992): Urban Development and Urban Research in India, Khanna Publication, New Delhi.
7. Ramachandran R (1989): Urbanisation and Urban Systems of India, Oxford University Press, New Delhi

Paper V Core Course	Practical II			Subject Code:
	L-T-P-C: 0-0-8-4	Credit Units: 4	Scheme of Evaluation: (P)	GEO164C2 15

Course Objectives: *It aims to give the idea of the importance of various surveying techniques in geographical study, the concepts regarding scale, map projections to suit map purposes and understand the field ethics and different tools of field study.*

Course Outcomes:

By the end of this course the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO1.	Recall varied cartographic terms, terminologies and techniques.	BT 1
CO2.	Construct different types of projections.	BT 2
CO3.	Develop the skills in preparation of thematic maps at various levels.	BT 3
CO4.	Analyze GIS based maps and perform spatial analysis, classify remote sensing satellite-based data and prepare large scale maps by using traditional surveying equipment and GPS survey.	BT 4
CO5.	Assess the multiple surveying techniques and its application.	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Population projection model and graph of India /North East India/ Any State of India - 1 Exercise ; Cartogram for socio-economic or any other data of India or North East India - Urban population by proportionate sphere or circles - 1 Exercise ; Preparation of one quantitative thematic map (Choropleth technique or Isopleth technique) by using district level data of any state of India - 1 Exercise	12
Unit 2	Map Projection: Basic concepts, classification, basic Principles of construction of zenithal, conical and cylindrical groups of map projections and choice of map projections. Construction of graticules and drawing of maps thereon including properties and uses of: Zenithal Gnomonic Projection (Equatorial case) Mollweide's Projection Conical Projection with two-standard parallels Lambert's Conical Equal Area Projection Mercator's Projection Preparation of topographic maps / profile/ contouring by using: Plane Table / Prismatic Compass Surveying - (1 Exercise) Profile / Contouring by Dumpy Level / Autolevel- (1 Exercise)	12
Unit 3	Georeferencing of maps by using Open Source GIS / Professional GIS Software (1 Exercise), Map in UTM Projection System (1 Exercise), Map digitization and creation of point, line and polygon layers (3 Exercises), Preparation of thematic maps (2 Exercises);	12
Unit 4	Digital Image Processing- Unsupervised Classification and Supervised Classification (2 Exercises); Geographic Analysis of Spatial data: Spatial Mean Centre and Standard Distance (1 Exercise); Preparation of maps by using GPS data (1 Exercise), Digital Elevation Modelling creation through different techniques(2 exercise)	12
	Total	48

Text Books:

As per the list of GEO164C203 and GEO164C204

Reference Books:

As per the list of GEO164C203 and GEO164C204

SCHEME OF EVALUATION (GEO164C215)

- Internal Assessment and Mid-term Examinations: As per the University rules
- End Semester Examination should consist of the questions taking any one exercise from each module. The module-III and IV should have optional questions.
- The distribution of marks for each module will remain equal as far as practicable (Each question with 10% -20% variation in the distribution of marks may be set based on difficulty level and time requirements to perform the exercise). 80% of the total marks is reserved for 4 exercises to be performed with total duration of 4 (four) hours
- 10% of total marks is reserved for External Examiner
- 10% of total marks is reserved for Practical Records and Note Book
- Maintenance of Practical Records and Note Book is mandatory
- External Examiner is mandatory during End Semester Examination

SEMESTER III

Paper I Core Course	GIS AND GPS: PRINCIPLES AND APPLICATIONS	Subject Code:
	L-T-P-C: 4-0-0-4 Credit Units: 4 Scheme of Evaluation: (T)	GEO164C301

Course Objectives: *The course aims to make the students interpret the data, tools and technology and applications of Geoinformatics - GIS, Remote Sensing and GPS and Construct and Analyse maps using Geospatial Technology (Geoinformatics)*

Course Outcomes:

After successful completion of the course, the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO1.	Define the fundamental terms and terminologies of Geoinformatics.	BT 1
CO2.	Outline the strength and application of Geospatial Technology.	BT 2
CO3.	Build map of the resources, their location and availability.	BT 3
CO4.	Analyse the different remote sensing data sets collected from various platforms.	BT 4
CO5.	Interpret Geospatial data in GIS platforms and perform analysis from various sources of data such as Remote Sensing and GPS for geographical research	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Geographical Information Sciences – a brief history; Definitions of GIS, Components of a GIS; Referencing systems: International Terrestrial Reference Frame (ITRF); Ellipsoids and datum, Coordinate Systems; GIS data types and structure, Types of GIS Software Systems; Database Management Systems; Relational Database Management System	12
Unit 2	Digital Elevation Model (DEM) and its derivatives; Analysis and uses of DEM; DEM data sources and data characteristics: SRTM, CartoSat DEM, ASTER, GLOBE, GTOPO, ALOS PRISM; 3-D visualization parameters of DEM; Methods for spatial interpolation for creating continuous 2-D surfaces from point / line data, their advantages and disadvantages; Triangulated Irregular Network (TIN) data structure and its characteristics.	12
Unit 3	GIS data collection, Creating and maintaining geographic databases; Geographic query and analysis: Map queries and map algebra, Map overlays- arithmetic and weighted overlays; Geoprocessing - Buffering and Proximity analysis	10
Unit 4	Basic concepts of GPS, Working principles of GPS, GPS errors and their corrections, GPS Receivers and their characteristics, Differential Positioning, Accuracy in GPS and DGPS, GPS surveying methods; Topographic mapping and GIS applications for GPS / DGPS.	14
	Total	48

Text Books:

1. Burrough, P. A., 1986: Principles of Geographical Information Systems in Land Resources Assessment, Clarendon Press, Oxford
2. Burrough, P. A. and McDonnell, R. A., 1998: Principles of Geographical Information Systems, Oxford University Press, Oxford.
3. Curtis, H., 2000: The GPS Accuracy Improvement Initiative, GPS World, June, 2000.
4. Chrisman, N., 1997: Exploring Geographic Information Systems, John Wiley & Sons Inc.,
5. De Mars, M. N., 1999: Fundamentals of Geographic Information Systems, John Wiley & Sons Inc., New York.
6. Gopi, S., 2005: Global Positioning System Principles and Applications, Tata McGraw Hill, New Delhi.
7. Kraaak, M. and Ormelling, F., 2004: Cartography Visualization of Geospatial Data, Pearson Education, Delhi.

Reference Books:

1. Chetry, N., (Editor) 2019: A Glimpse of Geospatial Technologies and Applications, EBH Publishers (India), Guwahati
2. Star, J. and Ester, J., 1990: Geographic Information System, Prentice-Hall.
3. Maguire, D. J., Goodchild, M. and Rhind, D. J., 1990: Geographical Information Systems: Principles and Applications, Longman Science and Technology Publications.
4. Robinson, A. H., et al., 1995: Elements of Cartography, John Wiley.

Paper II Core Course	PRINCIPLES OF REMOTE SENSING			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164C302

Course Objectives: *This course intends to show the rationale behind the use of remotely sensed data and its advantages and disadvantages and illustrate how GIS/GPS methodologies can be used to address spatial analysis from the theoretical and practical perspective.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO1.	Define basic concepts of remote sensing.	BT 1
CO2.	Explain principles and applications of various remote sensing techniques including aerial photography.	BT 2
CO3.	Utilize remote sensing data products for minor and major projects on environmental/natural resource assessments and mapping, disaster and hazard management, urban planning, and many applications.	BT 3
CO4.	Apply this knowledge for land use land cover map preparation.	BT 3
CO5.	Interpret Geospatial data	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Needs and applications of Aerial photography; Aerial photography platforms; Planning aerial photography survey missions; Aerial camera and film characteristics; Types of aerial photographs, Vertical air photographs – its geometry, scale and height measurements, stereoscopic measurements of aerial photographs; Image / photo interpretation keys / elements;	12
Unit 2	Earth observation satellites (EOS) and Remote Sensing (RS) satellites - orbital characteristics; Payloads of RS satellites; Types and characteristics of sensors; Spatial, radiometric, spectral and temporal resolutions of RS data; Path –Row referencing system; Data products, characteristics and uses of selected Remote Sensing Satellites– LANDSAT, IRS, SPOT, Quickbird, GeoEye and Sentinel data	12
Unit 3	Electromagnetic radiation (EMR) principles, Spectral signatures / responses of earth materials – water, vegetation, urban landscape, soils and minerals; Major areas applications of remote sensing; Natural resource monitoring and management; Disaster management; Biomass estimation, Crop yield and acreage estimation.	12
Unit 4	Introduction to Digital Image Processing (DIP) tools and techniques: Data preparation processes and techniques; Image classification techniques (Supervised and Unsupervised); Major classifiers / classification functions; Change detection analysis and accuracy assessment methods. Basic ideas and applications of thermal, hyperspectral, microwave and LiDAR Remote Sensing.	12
Total		48

Text Books:

1. Agarwal, C. S., and Garg, P. K., 2000: Textbook on Remote Sensing in Natural Resources Monitoring and Management, Wheeler Publishing, New Delhi.
2. Anji Reddy, M., 2008: Textbook of Remote Sensing and Geographic Information System, B.S. Publication, Hyderabad

Reference Books:

1. American Society of Photogrammetry, 1960: Manual of Photographic Interpretation, Banta Publishing Co., Menasha, Wisconsin.
2. Barret, E. C. and Curtis, L.E., 1976: Introduction to Environmental Remote Sensing, Chapman Hill, London.
3. Chetry, N. (Editor), 2019: A Glimpse of Geospatial Technologies and Applications, EBH Publishers (India), Guwahati
4. Curran, Paul, J., 1985: Principles of Remote Sensing, Longman Group Ltd.
5. Sabins, Floyd F., 1987: Remote Sensing Principles and Interpretation, W.H. Freeman and Company, New York.
6. Anderson, J. R., et al., 1976: A Landuse / Landcover Classification System for Uses with Remote Sensing Data, USGS Professional Paper
7. Avery, T.E., 1963: Interpretation of Aerial Photography, Burgess Publishing Co., Minneapolis.
8. Gonzalez, R. C., Woods, R. E., 2000: Digital Image Processing, Fifth Indian Reprint, Addison Wesley Longman, Delhi
9. Jensen, J. R., 2011: Remote Sensing of the Environment – An Earth Resource Perspective, 3rd Impression, Pearson, New Delhi
10. Joseph, George, 2005: Fundamentals of Remote Sensing, United Press India, Hyderabad.
11. Lilesand, T.M. and Kiefer, R.W., 2007: Remote Sensing and Image Interpretation, 6th Edition, John Wiley.
12. Rampal, K. K., 1999: Handbook of Aerial Photography and Interpretation, Concept Publishing Company, New Delhi-59.
13. Wolf, P. R., Dewitt, B. A., 2000: Elements of Photogrammetry With Applications in GIS, McGraw Hill, New York.

Paper III Core Course	RESEARCH METHODOLOGY IN GEOGRAPHY			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164D302

Course Objectives: *The course aims to make the students understand the basics of qualitative and quantitative research, literature review, data collection, identification of research problem, formulate research objectives and research questions, formulation of hypothesis and testing, framing of questionnaires, techniques of collection of both qualitative and quantitative data and their analysis.*

Course Outcomes:

After the completion of course, the students will have ability to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO1.	Define the concepts and tools of research.	BT 1
CO2.	Infer ideas that can be taken up for research work through literature review.	BT 2
CO3.	Develop hypothesis and research questions.	BT 3
CO4.	Identify appropriate data collection and sampling techniques.	BT 3
CO5.	Interpret the various types of data along with critical evaluation .	BT 5
CO6.	Design and develop a scientific research report	BT 6

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Research: Definition, types, significance and important features; Research methodology in geography; Defining a research problem; Statement of the problem; Objectives, and hypothesis/ research questions, Database and methodology, significance, review of research works and bibliography and references.	12
Unit 2	Research design: Meaning, need and features of a good design, Inductive and deductive approaches in geographic research, Hypothesis, theories and models in Geography; concept of model building and hypothesis testing, Research ethics: Plagiarism-classification and prevention; Intellectual property rights; Research report: Structural components and presentation.	12
Unit 3	Field Work in Geographical Studies – Role, Value, Data and Ethics of Field-Work; Defining the Field and Identifying the Case Study – Rural / Urban / Physical / Human / Environmental; Designing the Field Report – Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report	12
Unit 4	Sources of geographic data (Conventional and Geospatial technology based), their representation, interpretation and analysis; Field Tools and Techniques – Merits, Demerits and Selection of the Appropriate Technique; Observation (Participant / Non Participant), Questionnaires (Open/ Closed / Structured / Non-Structured) Interview with Special Focus on Focused Group Discussions	12
Total		48

Note: Computer / calculator based compulsory home assignments may be given for various units. Scientific calculator may be permitted in the examination hall for this paper.

Text Books:

1. Harvey, D, 1969: Explanation in Geography, Scientific Publisher, Jodhpur.
2. Lenon, B., Cleves, P. 2015. Geography Fieldwork and Skills, Harper-Collins.
3. Montello , D.R, Sutton, P. 2012. An Introduction to Scientific Research Methods in Geography and Environmental Studies, 2nd ed, Sage.
4. Murthy , K.L.N. 2004. Research Methodology in Geography: A Text Book, Concept Publishing Co.

Reference Books:

1. Evans, M., (1988): "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
2. Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2 (2001).
3. Stoddard, R. H., (1982): Field Techniques and Research Methods in Geography, Kendall/Hunt.
4. Wolcott, H., (1995): The Art of Fieldwork, Alta Mira Press, Walnut Creek, CA.
5. Northey, N., Draper, D., Knight, D.B. 2015. Making Sense in Geography and Environmental Sciences:A Student's Guide to Research and Writing, 6th ed, Oxford University Press.
6. Parsons, T., Knight, P.G. 2015. How To Do Your Dissertation in Geography and Related Disciplines,3rd ed, Routledge.

Paper IV Core Course	DISASTER MANAGEMENT			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164C304

Course Objectives: *The objective of this course is to make the student understand about the hazards, disasters, its associated causes and impacts, its distribution and mitigation with special reference to India.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
SI No.	Course Outcome	Blooms Taxonomy Level
CO1.	Define the concepts of hazard and disaster and its related terminologies.	BT 1
CO2.	Demonstrate the distribution and mapping of disasters that is prevalent in India.	BT 2
CO3.	Explain the mitigation process and response to disasters across Indian territory.	BT 2
CO4.	Distinguish between causes and effect of varied disasters, as well as their implications in present day India.	BT 4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Disasters: Definition and Concepts: Hazards, Disasters; Risk and Vulnerability; Classification	12
Unit 2	Disasters in India: (a) Flood: Causes, Impact, Distribution and Mapping; Landslide: Causes, Impact, Distribution and Mapping; Drought: Causes, Impact, Distribution and Mapping	12
Unit 3	Disasters in India: (b) Earthquake and Tsunami: Causes, Impact, Distribution and Mapping; Cyclone: Causes, Impact, Distribution and Mapping. Manmade disasters: Causes, Impact, Distribution and Mapping	12
Unit 4	Response and Mitigation to Disasters: Mitigation and Preparedness, NDMA and NIDM; Indigenous Knowledge and Community-Based Disaster Management; Do's and Don'ts During and Post Disasters	12
Total		48

Text Book:

1. Singh, R. B. (ed.), (2006) Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.
2. Sinha, A. (2001). Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.

References:

1. Government of India. (1997) Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.
2. Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
3. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
4. Singh, R.B. (2005) Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi.
5. Stoltman, J.P. et al. (2004) International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.
6. Singh Jagbir (2007) "Disaster Management Future Challenges and Opportunities", 2007. Publisher- I.K. International Pvt. Ltd. S-25, Green Park Extension, Uphaar Cinema Market, New Delhi, India (www.ikbooks.com).

Paper V Core Course	Report Writing on Environmental Issues	Subject Code: GEO164C325
	Credit Units: 4 Scheme of Evaluation: (P)	

Course Objectives: *This course intends to make the students understand the various dimensions of field work and its role in geographical studies, along with introducing to basic report writing and field tools.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	Course Outcome	Blooms Taxonomy Level
CO1	Choose new geographical landscape as study area.	BT1
CO2	Infer in-depth knowledge of different field techniques.	BT2
CO3	Choose the field ethics and different tools of field study.	BT3
CO4	Analyze different field techniques in detail.	BT4

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Selection of a nearby urban, industrial, or agricultural area facing notable environmental degradation (e.g., pollution, soil erosion, water scarcity, waste mismanagement), Field reconnaissance survey: preparation of base maps using GPS, Google Earth, or topographic sheets, Mapping of physical and environmental features: land use/land cover patterns, pollution sources (air, water, soil, noise), waste disposal sites, vegetation status, etc, Observation and documentation of visible environmental problems: solid waste accumulation, sewage disposal, chemical runoff, loss of biodiversity, etc, Interaction with local stakeholders for preliminary insights into the problem, Maintenance of field diaries and photographic documentation.	12
Unit 2	Framing the core environmental problem for research based on field observations, Compilation of academic and policy literature from journals, books, government reports, and case studies related to the identified problem, Critical review of existing studies and theoretical frameworks (e.g., environmental degradation, pollution control, sustainability, urban ecology), Identification of research gaps and formulation of specific research questions/hypotheses, Development of conceptual models or problem trees to understand causal relationships.	12
Unit 3	Preparation of structured and semi-structured questionnaires for stakeholders (residents, farmers, local authorities), Surveys, interviews, transect walks, environmental sampling (air, water, soil, etc.), Recording of qualitative and quantitative data, Use of census reports, municipal records, pollution control board data, weather records, satellite images, etc., Data coding, entry, and basic statistical summarization using Excel or any GIS/statistical software	12
Unit 4	Generation of report (within about 100 A4 size pages including 30-40 maps/diagrams/field photographs) on the basis of field works carried out under , Final project presentation by each student using PowerPoint during on the scheduled date of viva-voce examination of this paper.	12
Total		24

Text Books:

1. Creswell, J., (1994). *Research Design: Qualitative and Quantitative Approaches*. UK: Sage Publications.

2. Dikshit, R. D. (2003). *The Art and Science of Geography: Integrated Readings*.

Reference books:

1. Evans, M. (1988). Participant Observation: The Researcher as Research Tool. In Eylesand, J and D. Smith (eds). *Qualitative Methods in Human Geography*. Cambridge, UK: Polity.
 2. Mukherjee, N. (2002). *Participatory Learning and Action: with 100 Field Methods*. Delhi, India: Concept Publs. Co.
 3. Stoddard, R. H. (1982). *Field Techniques and Research Methods in Geography*. USA: Kendall/Hunt.
- Wolcott, H. (1995). *The Art of Fieldwork*. CA, USA: Alta Mira Press.

Paper IV Core Course	Research Project (Minor)			Subject Code:
	L-T-P-C:	Credit Units: 8	Scheme of Evaluation: (P)	GE0164C3 24

Learning Objectives: *This paper provides an understanding the basics of research project preparation.*

Learning Outcomes:

After the completion of course, the students will have ability to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO6.	Relate real world issues for carrying out research on a specific field	BT 1
CO7.	Infer ideas of research through literature review.	BT 2
CO8.	Develop hypothesis and research questions.	BT 3
CO9.	Identify appropriate sampling techniques.	BT 3
CO10.	Interpret the various types of data along with critical evaluation .	BT 5
CO11.	Design and develop a detail project report	BT 6

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	<p>Identification of research problem / topic on any one of the following aspects (preferably of local area / Gram Panchayat / Revenue circle / District / State) during the 3rd semester:- Any kind of geographical studies on socio-economic / cultural issues / demographic problems and characteristics The topic selection / modification may be done just before the 2nd Semester End Examination so that the data collection can be done during semester break.</p> <p style="text-align: center;">OR</p> <p>Internship in institutes, organizations, and firms of repute in Northeast India.</p>	24
Unit 2	<p>Preparation of project report in prescribed format during 6th - 8th week of the commencement of course of 3rd semester. Submission of the report after a week of the announcement of routine for 3rd End Semester Examination. Final project presentation by each student using PowerPoint during on the scheduled date of viva-voce examination of this paper.</p> <p style="text-align: center;">OR</p> <p>Preparation of internship report in prescribed format during 6th - 8th week of the commencement of course of 3rd semester. Submission of the report after a week of the announcement of routine for 3rd End Semester Examination.</p>	24
	Total	48

Note: Students will work as an intern during the semester break for 4 weeks after 4th semester. Students not being able to obtain any internship will be assigned project work from the department.

Text Books:

As per the list of given in the syllabus for other papers

Reference Books:

As per the list of given in the syllabus for other papers

SEMESTER IV

Paper I Core Course	GEOGRAPHY OF POPULATION AND GENDER	Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4
	Scheme of Evaluation: (T)	
		GEO164C401

Course Objectives: *The course aims to make students understand different concept related to population and their characteristics.*

Course Outcomes:

By the end of this course the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO1.	Tell about the basic definitions and concepts related to population geography and human settlements.	BT 1
CO2.	Outline the population parameters of India.	BT 2
CO3.	Apply and analyse the resultant impact of contemporary issues related to population on society and environment.	BT 3
CO4.	Analyse contemporary issues related to population dynamics and environment.	BT 4
CO5.	Determine clear exposition of spatial and structural characteristics of human settlements.	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Field of Population Geography, Basic concepts of Population Geography: under population, optimum population, over population, population explosion and population pressure, Population resource relationship, population-resource regions, World population distribution and growth, components of population growth: fertility, mortality, migration.	10
Unit 2	Population composition: age, sex, child women ratio and other related factors, Demographic transition model and theories of population Growth (Malthus, Sadler and Ricardo), Population policies in developed and developing economies; Gender and Space: Safety, Mobility, Exclusion; Spatial patterns of gender disparities in sex ratio differentials, female literacy, work force participation; gender, health and access to healthcare; land ownership and property rights; patterns of participation in local and national politics.	14
Unit 3	Defining the field and scope of Settlement Geography and its approaches, origin and growth of settlement: rural and urban, types and pattern of settlement, concepts of rural-urban dichotomy, continuum and urban fringe, urban system (Law of primate city and rank size rule).	10
Unit 4	Concept of urbanization and westernisation, functional classification of urban settlements, internal structure of cities / settlement hierarchy with reference to central place theory (Christaller and Losch): Measurement of centrality, nodality and hierarchy	14
	Total	48

Text Books:

1. Singh R.Y. (Rep. 2010) - Geography of Settlements, ShardaPustakBhawan, Allahabad
2. Chandna R. C. (Rep.2010) – A Geography of Population, Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi.
3. Maurya S.D (Rep. 2018): Settlement Geography, ShardaPustakBhawan, Allahabad
4. Sandram, K. V. and Nangia, S., (eds): Population Geography, Heritage Publishers, New Delhi. Inc., New York.
5. Ghosh, S. (2015) Introduction to Settlement Geography, Orient Black Swan Private Ltd., Kolkata.

Reference Books:

1. Clarke, J. I., 1972: Population Geography, Pergamon Press, Oxford.
2. Peters, G. L. and Larkin, R. P., 1979: Population Geography: Problems, Concepts and Prospects, Kendall/ Hunt Iowa.
3. Trewartha, G. T., 1969: A Geography of Population: World Pattern, John Wiley & Sons.
4. Woods, R., 1979: Population Analysis in Geography, Longman, London.
5. Robinson, H., 1981: Population and Resources, Macmillan Press, London
6. Kaushik, S.D. (2010) ManavBhugol, Rastogi Publication, Meerut.
7. Maurya, S.D. (2012) ManavBhugol, ShardaPustakBhawan, Allahabad.

Paper II Core Course	ENVIRONMENT AND SUSTAINABLE DEVELOPMENT			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GE016C404

Course Objectives: *The course aims to give the idea of the concept of global environment and its impact on various aspects, along with providing knowledge on adaptation and mitigation of climate impacts and also to know institutional role in it.*

Course Outcomes:

By the end of this course the students will be able to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO1.	Relate to basics of science of environmental change and sustainable development.	BT 1
CO2.	Classify different types of natural resources and its importance.	BT 2
CO3.	Develop understanding about various impacts of Climate Change on Agriculture and Water, Flora and Fauna, Human Health, ozone layer and other spheres of environment.	BT 3
CO4.	Inspect upon the issues of adaptation and mitigation from hazards and management of solid wastes.	BT 4
CO5.	Explain the policies of development and environmental protection in developed and developing countries.	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Introduction to Environment: definition and concept, types, Environmental factors, The Global Environment and its segments and development, Natural resources: renewable and non-renewable, land resources, water resource, forest resource and energy resource	12
Unit 2	Man- environment relationship: Historical perspectives on man's interaction with environment; population growth and environment; Man and atmosphere: Man as a factor of climatic change; Global environmental problems: Types and extent of environmental problems, area-specific major environmental issues and problems.	12
Unit 3	Concept of sustainability, concept of sustainable development, history, : relation among environment, economy and society, Pillars and principles of Sustainable development, Environmental Pollution- causes and effects, Nuclear Hazard and Human Health, Solid Waste Management, Climate Change and Global warming, ozone layer depletion and its impacts	12
Unit 4	Environmental protection movements: Chipko Movement, Silent Valley, Narmada Bachhao Andoloan; Environmental Legislation Programme in India: Wildlife Protection Act, Water Act, Forest Act, Air Act, Environmental Protection Act, International Agreement-Earth Summit, UNFCC, Montreal and Kyoto Protocol, Environmental Communication and Awareness	12
	Total	48

Paper III Core Course	Biodiversity Conservation		Subject Code: GEO164C403
	L-T-P-C: 2-0-4-2	Credit Units: 2	

Course Objectives: *This course intends to make the students understand the importance of biodiversity and its conservation*

Course Outcomes:

After the completion of the course, the students will have the ability to:		
Sl. No.	Course Outcome	Blooms Taxonomy Level
CO1	Build ideas on importance of biodiversity	BT1
CO2	Analyse the ways of biodiversity conservation at micro, meso and macro level	BT2
CO3	Interpret the various techniques of biodiversity conservation	BT3

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Threats: Factors causing biodiversity degradation, Concept of species extinction. Traditional Conservation Practice: Traditional Ecological Knowledge and documentation of local biodiversity.	6
Unit 2	Species Conservation Techniques: In situ conservation (Biosphere Reserves, National Parks, Wildlife Sanctuaries, Conservation Reserves, Community reserves, Sacred Habitats),	6
Unit 3	Ex-situ conservation (Botanical & Zoological Gardens, Gene Banks, Seed And Seedling Banks, Pollen Culture, Tissue Culture and DNA banks, Butterfly Gardening); Concept of Biodiversity Hotspots and Mega-diversity Country; Role of captivity in wildlife management.	
Unit 4	Habitat Conservation Techniques: Concept of Habitat, Habitat Management, Habitat Edge improvement, Role of Corridor in Wildlife Management, Ecological Restoration Programme; Social Forestry; Agro Forestry; Joint Forest Management	
	Total	24

Text Books:

3. Creswell, J., (1994). *Research Design: Qualitative and Quantitative Approaches*. UK: Sage Publications.
4. Dikshit, R. D. (2003). *The Art and Science of Geography: Integrated Readings*.

Reference books:

4. Evans, M. (1988). Participant Observation: The Researcher as Research Tool. In Eylesand, J and D. Smith (eds). *Qualitative Methods in Human Geography*. Cambridge, UK: Polity.
5. Mukherjee, N. (2002). *Participatory Learning and Action: with 100 Field Methods*. Delhi, India: Concept Pubs. Co.
6. Stoddard, R. H. (1982). *Field Techniques and Research Methods in Geography*. USA: Kendall/Hunt.
7. Wolcott, H. (1995). *The Art of Fieldwork*. CA, USA: Alta Mira Press.

Paper IV Core Course	GEOGRAPHY OF TOURISM			Subject Code:
	L-T-P-C: 4-0-0-4	Credit Units: 4	Scheme of Evaluation: (T)	GEO164C404

Course Objectives: *The course aims to make the students define the basic theme and concepts of tourism geography and interpret the geographical components of tourism.*

Course Outcomes:

By the end of this course the students will be able to:		
SI No.	Course Outcome	Blooms Taxonomy Level
CO1.	Define the geographical aspects that organise economic space.	BT 1
CO2.	Illustrate the geographical aspects of tourism in an area.	BT 2
CO3.	Develop practical field knowledge about tourist places across India.	BT 3
CO4.	Analyse the knowledge gathered through field visits and prepare their respective reports.	BT 4
CO5.	Justify the methods of tourist flow in relation to the geographical setting of an area.	BT 5

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Meaning, Scope and contents of Geography of tourism: Definition of tourism and its scope; Factors influencing tourism: historical, natural, socio cultural and economic, Importance of geography in tourism, Types of tourism, Constituents of tourism industry	10
Unit 2	Concept of Sustainable tourism: Definition and principles of sustainable tourism, Dimensions of sustainability, Impact of tourism - Environmental, Social, Cultural, and Economic; Concept of Responsible tourism, Global environmental change and tourism, concept of carrying capacity	14
Unit 3	Resources of Tourism: Destination and resource factors, Mass tourism vs. alternative tourism, Ecotourism, Spatial pattern of Tourism Resources in India-National Parks, Wild life sanctuaries, Tiger Reserves, Biosphere reserves & wetlands., history and culture	10
Unit 4	Understanding tourism system: Leiper's Model, Tourist map design, Travel Flows: models, trends and types, Important tourist destination of India, Tourist destinations in North America, South America, Europe, Africa, Antarctica, Australia and Asia, latitude, longitude and international date line	14
Total		48

Text Books:

1. Bhatia, A. K., 1996: Tourism Development: Principles and Practices, Sterling Publishers, New Delhi.
2. Milton, D., 1993: Geography of World Tourism Prentice. Hall, New York.
3. Sharma J. K. (ed.), 2000: Tourism Planning and Development - A new perspective, Kanishka Publishers, New Delhi.

Reference Books:

1. Robinson, H., 1996: A Geography of Tourism. Macdonald and Evans, London, 1996.
2. Williams Stephen, 1998: Tourism Geography, Routledge, Contemporary Human Geography Series, London.
3. Shaw G. and Williams A. M., 1994: Critical issues in Tourism-A Geographical Perspective, Oxford: Blackwell.

Core Course	Report Writing on Socio-economic Issues			Subject Code:
	L-T-P-C: 0-0-8-4	Credit Units: 4	Scheme of Evaluation: (P)	GEO162C4 25

Course Objectives: *This paper provides an understanding the basics of research project preparation.*

Course Outcomes:

After successful completion of the course, the students will be able to:		
Sl. No.	Course Outcome	Blooms Taxonomy Level
C01	Relate real world issues for carrying out research on a specific field	BT1
C02	Infer ideas of research through literature review.	BT2
C03	Develop hypothesis and research questions.	BT3
C04	Identify appropriate sampling techniques.	BT4
C05	Interpret the various types of data along with critical evaluation .	BT5
C06	Design and develop a detail project report	BT6

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	Identification of research problem / topic on any one of the following aspects (preferably of local area / District / State) Any kind of geographical studies on socio-economic / cultural issues / demographic problems and characteristics The topic selection / modification may be done just before the 2nd Semester End Examination so that the data collection can be done during semester break.	12
Unit 2	Preparation of Literature Review from the identified problem of research	12
Unit 3	Preparation of questionnaire, Field visit, Primary data collection, Secondary data review.	12
Unit 4	Generation of report (within about 100 A4 size pages including 30-40 maps/diagrams/field photographs) on the basis of field works carried out under , Final project presentation by each student using PowerPoint during on the scheduled date of viva-voce examination of this paper.	12
Total		48

Note: Students will work as an intern during the semester break for 4 weeks after 4th semester. Students not being able to obtain any internship will be assigned project work from the department.

Text Books:

As per the list of given in the syllabus for other papers

Reference Books:

As per the list of given in the syllabus for other papers

Core Course	RESEARCH (Major)			Subject Code:
	L-T-P-C:	Credit Units: 12	Scheme of Evaluation: (P)	GEO164C426

Learning Objectives: The course aims to make the students understand how to approach a research problem and to formulate research objectives and research questions in proper perspective, formulation of hypothesis and testing, framing of questionnaires, techniques of collection of both qualitative and quantitative data and their analysis.

Learning Outcomes:

After the completion of course, the students will have ability to:		
CO No.	Course Outcome	Blooms Taxonomy Level
CO12.	Choose appropriate research methods for carrying out research on a specific field.	BT 1
CO13.	Infer ideas and classify the issues that needs attention for formulation of hypothesis.	BT 2
CO14.	Develop hypothesis and research questions.	BT 3
CO15.	Identify appropriate sampling techniques.	BT 3
CO16.	Interpret the various types of data along with critical evaluation .	BT 5
CO17.	Design and develop a detail project report	BT 6

Detailed Syllabus:

Modules	Topics and Course Content	Periods
Unit 1	<p>Identification of research problem / topic on any one of the following aspects (preferably of local area / Gram Panchayat / Revenue circle / District / State) during the 3rd semester while working with a minor project by the individual student:- Any kind of geographical studies on socio-economic / cultural issues / demographic problems and characteristics</p> <ol style="list-style-type: none"> Agriculture, Industry, Mining related issues Environmental problems of the locality including disasters and hazards Natural resources assessments, planning and management Ecological crisis, Climate change and consequences Rural / Urban Ecosystems; Terrain / basin / watershed characterization and evaluation including integrated development studies <p><i>(This list is indicative only, the student may consult the assigned teacher as project supervisor / guide. Project supervisor / guide to each student will be allocated).</i> The topic selection / modification may be done just before the 3rd Semester End Examination so that the data collection can be done during semester break. A fresh project proposal / modified project proposal of minor project done in 3rd semester is to be submitted by each student (within 2nd week of the commencement of 4th semester classes) by mentioning the following:-</p> <ol style="list-style-type: none"> Project title Introduction to the problem Aims / objectives Research questions Database and Methodology Study of relevant literature Organization of study <p style="text-align: center;"><i>Marks for internal evaluation = 14</i></p>	12
Unit 2	<p>Project proposal presentation by each student using PowerPoint during 3rd week of the commencement of the course of 4th semester.</p> <p style="text-align: center;"><i>Marks for internal evaluation = 14</i></p>	12
Unit 3	<p>Reporting of data collection, tabulation, processing, mapping/charting and analysis by each student using PowerPoint during 5th week of the commencement of the course of 4th semester.</p> <p style="text-align: center;"><i>Marks for internal evaluation = 14</i></p>	12

Unit 4	Preparation of project report in prescribed format during 6th - 8th week of the commencement of course of 4th semester. Submission of the report after a week of the announcement of routine for 4th End Semester Examination. Final project presentation by each student using PowerPoint during on the scheduled date of viva-voce examination of this paper. <i>Marks for external evaluation = Viva-voce 8 + Presentation 20 = 28</i>	12
Total		48

Note: Submission of project report in prescribed format and on specified date is mandatory. Equal weightages of marks for each stage of the work (upto 3rd stage) for internal evaluation of the project by the supervisor (60% of end semester examination). 40% of the total marks of end semester examination is for viva-voce and final presentation to be evaluated by an external examiner.

Text Books:

As per the list of given in syllabus based on topic selected

Reference Books:

As per the list of given in syllabus based on topic selected