DEPARTMENT OF GEOGRAPHY
RAJIV GANDHI UNIVERSITY

Course Structure & Syllabus for
M A / M. Sc. Geography
w.e.f. 2020-21

DEPARTMENT OF GEOGRAPHY
RAJIV GANDHI UNIVERSITY
SYLLABUS STRUCTURE FOR M.A. / M.Sc. GEOGRAPHY W.E.F. 2020-21

Code	Title	Credit			Full Marks	Mid Term	End Term	Pass Marks 40% each
		L	P	T				
	I SEMESTER							
GEOGC101	Geographic Thought	4			100	20	80	9+36
GEOGC102	Geomorphology	4			100	20	80	9+36
GEOGC103	Climatology	4			100	20	80	9+36
GEOGC104	Settlement Geography	4			100	20	80	9+36
GEOGC105	Geographical Analysis		4		100	20	80	9+36
	II SEMESTER							
GEOGC201	Population Geography	4			100	20	80	9+36
GEOGC202	Economic Geography	4			100	20	80	9+36
GEOGC203	Social Geography	4			100	20	80	9+36
GEOGC204	Regional Planning	4			100	20	80	9+36
GEOGC205	Quantitative Techniques and Computer Application		4		100	20	80	9+36
	III SEMESTER							
GEOGC301	Remote Sensing and Geographical Information System	4			100	20	80	9+36
GEOGC302	Application of Remote Sensing and GIS		4		100	20	80	9+36
GEOGC303	Geography of North-East India	4			100	20	80	9+36
	Department Elective (Students has to choose any <u>one</u> from the following options)							
GEOGE304	Soil Geography (Physical stream)	4			100	20	80	9+36
GEOGE305	Biogeography (Environmental stream)	4			100	20	80	9+36
GEOGE306	Rural Development and Planning (Regional Planning stream)	4			100	20	80	9+36
GEOGE307	Gender Geography (Human stream)	4			100	20	80	9+36
	Open Elective (any <u>one</u> from the list of options to be notified by the Department depending upon feasibility)							
GEOGO308	Geography of India	4			100	20	80	9+36
GEOGO309	Geography of Tourism	4			100	20	80	9+36
GEOGO310	Application of Remote Sensing and GIS in Environmental Studies (excluding students from Geography Department)	4			100	20	80	9+36
	IV SEMESTER							
GEOGC401	Mountain Geography	4			100	20	80	9+36
GEOGC402	Sustainable Development and EIA	4			100	20	80	9+36
One of the following stream is to be chosen by each student commensurate to his/her elective paper of the third semester								
Physical Stream								
GEOGE403	Hydrology	4			100	20	80	9+36

GEOGE404	Geography of Landforms	4			100	20	80	9+36
GEOGE405	Geomorphic Mapping and Hydrological data and Project Report		4		100	20	80	9+36
Environmental Stream								
GEOGE406	Phytogeography	4			100	20	80	9+36
GEOGE407	Zoogeography	4			100	20	80	9+36
GEOGE408	Field Work and Project Report		4		100	20	80	9+36
Regional Planning Stream								
GEOGE409	Agricultural Geography	4			100	20	80	9+36
GEOGE410	Managing Disaster in North East India	4			100	20	80	9+36
GEOGE411	Field Work and Project Report		4		100	20	80	9+36
Human Stream								
GEOGE412	Urban Geography	4			100	20	80	9+36
GEOGE413	Cultural Geography	4			100	20	80	9+36
GEOGE414	Field Work and Project Report		4		100	20	80	9+36

GEOGC101: GEOGRAPHIC THOUGHT

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Fundamentals: i. Development of Geographical ideas: a. Indian, b. Greek and c. Roman ii. Place of Geography in relation to other Natural and Social Sciences
II	Development of Modern Geography: i. Impact of Explorations and Discoveries ii. Founders of Modern Geography: a. Humboldt b. Ritter
III	Dichotomies in Geography: i. Physical and Human ii. Determinism and Possibilism iii. Regional and Systematic iv. Qualitative and Quantitative
IV	Schools of Geographic Thought: i. German ii. French iii. Anglo-American iv. Emergence of New Geography: Quantitative Revolution v. Behavioural, Radical, Humanistic and Post modernism

Suggested Readings:

1. Adhikari, S: Geographical Thought
2. Bunge, W. (1966): Theoritical Geography, Lund University, Series C
3. Dubey, B. (1967): Geographical Concept in Ancient India – NGSI, Varanasi
4. Dickinson, R.G. (1969): The Makers of Modern Geography, Routledege Kegan Paul, London
5. Harthshorne, R. (1939): The Nature of Geography, Association American Geography, O. Loncester
6. Hussain, M: Evolution of Geographical Thought, Rawat Publication, Jaipur
7. Misra, R.P. (1983 ed.): Contributions to Indian Geography Concepts and Approaches, Heritage Publication, New Delhi.
8. Taylor, G (1953 ed.): Geography in the 20th Century, Methuen, London
9. Tripathi, M.P: Development of Geographic Knowledge in Ancient India, Bharatiya Vidya Prakashan, Varanasi.
10. Wooldrige, S.W. (1960): Geographer as a Scientist, London
11. Peet, R. (1998). Modern geographic thought.

GEOGC102: GEOMORPHOLOGY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Major Thrust in Geomorphology: i. Quantitative geomorphology ii. Time in geomorphology iii. Threshold and equilibrium iv. Geomorphic system – open, closed and isolated
II	Geomorphological realms and tectonic geomorphology: i. Global tectonics and landform development ii. Geological structures and landforms iii. Continental Shield and Mountains iv. River Valleys and Planation surfaces
III	Process Geomorphology: i. Fluvial ii. Aeolian iii. Glacial iv. Coastal
IV	Rivers and River Basin: i. Processes of Channel initiation ii. Network development iii. Types and origin of River terraces iv. Delta formation

Suggested Readings:

1. Bloom, A.L. (1978) : A Systematic Analysis of late Cenozonic Landforms, Englewed Cliffs, M.J. Prentice Hall.
2. Hart, M.G. (1986) : Geomorphology : Pure and Applied, George Allen and Unwin, London.
3. Holmes, A. 1978: Principles of Physical Geology, 3rd Edn. London . Nelson.
4. King, C.A. M. : Techniques in Geomorphology : London : Edward Arnold.
5. Leopold, L.B. : Fluvial Processes in Geomorphology.
6. Pitty, A.F. : Geomorphology
7. Scheidegner, A.E. : Theoretical Geomorphology. Berlin : Springer – Verlag.
8. Small, R.J. : A Text Book on the Study of Landforms.
9. Thorn, C.E. : Introduction to Theoretical Geomorphology.
10. Thornbury, W.D. (1969) : Principles of Geomorphology. New York : Wiley.

GEOGC103: CLIMATOLOGY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Bases of Weather and Climate: i. The Atmosphere and its radiative effects ii. Insolation and temperature iii. Stability and instability, Climatic Region (Koppen) iv. Atmospheric Pressure systems and circulation patterns, ITCZ
II	Weather and Atmospheric Disturbances: i. Air masses and Fronts ii. Cyclones: Tropical and Temperate iii. Extreme events: Drought - Flood iv. Theory of El-Nino and La-Nina
III	Classification of Climate and contemporary issues: i. Trewartha classification of world climate ii. Classification of climate in India iii. Global Warming, Ozone Depletion iv. Climate Change Theories
IV	Applied Climatology: Concepts and Application i. Weather forecasting ii. Agroclimatology iii. Hydrometeorology iv. Satellite meteorology

Suggested Readings:

1. Critchfield, H.J. (1983) : General Climatology, Prentice Hall of India, New Delhi.
2. Lal, D.S. – Climatology.
3. Oliver John, E. and Hidore John, J. (2003) : Climatology, Pearson Education.
4. Subramanyam (1983) : General Climatology, Heritage, New Delhi.
5. Trewartha, G.T. and Horn, L.A. (1980) : An Introduction to Climate, Mc Graw Hill, New York.
6. Kidder, S. Q., KIDDER, R. M., & Haar, T. H. V. (1995). *Satellite meteorology: an introduction*. Gulf Professional Publishing.
7. Betts, A. K. (2004). Understanding hydrometeorology using global models. *Bulletin of the American Meteorological Society*, *85*(11), 1673-1688.
8. Gibbons, G. (1993). *Weather forecasting*. Aladdin.
9. Hatfield, J. L., Sivakumar, M. V. K., & Prueger, J. H. (2017). Agroclimatology: linking agriculture to climate, agronomy monographs 60, 2017

GEOGC104: SETTLEMENT GEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Introduction: i. Nature, scope, significance and approaches to study Settlement Geography ii. Development of Settlement Geography iii. Theories of evolution of settlements and Geographical factors affecting growth of settlement distribution iv. Types of Settlement: Rural and Urban Rural-urban dichotomy and continuum
II	Rural settlement: i. Site, location, types and pattern ii. Morphology of rural settlement iii. Rural House types: planned and architectural style in different geographical environment iv. Types and pattern of rural settlements with reference to North East India
III	Urban Settlement: i. Origin of the cities: Ancient and Medieval ii. Industrial growth and urban expansion iii. Functional classification of urban centres: Harris and Nelson iv. Functional classification of Indian cities: Ashok Mitra and others
IV	Settlement Hierarchy and Policies: i. Rural service center ii. Central Place theory (Christaller) iii. Theory of Losch and its application iv. Issues and policies of Settlements, settlement planning

Suggested Readings:

1. Ambrose, Peter, Concepts in Geography Vol.-I Settlement Pattern, Longman 1970.
2. Baskin, C., (Translator), Central Places in Southern Germany, Prentice-Hall Inc.
3. Haggett, Peter, Andrew D. Cliff and Allen Frey (editer), Locational Models Arnold Heinemann 1979.
4. King, Leslie, J., Central Place Theory, Saga Publications, New Delhi 1986.
5. Mayer, M. Harold and Clyde F. Kohn (editors), Readings in Urban Geography, Central Book Depot, Allahabad 1967.
6. Nangia, Sudesh, Delhi Metropolitan Region, K.B. Publications, New Delhi 1976.
7. Prakasa, Rao, V.L.S., Urbanisation in India; Spatial Dimensions, Concept Publishing Co., New Delhi 1983.
8. Ramachandran, R., Urbanisation and Urban Systems in India, Oxford University Press, New Delhi 1992.
9. Singh R.L. and KashiNath Singh (editors), Readings in Rural Settlement Geography, National Geographical Society of India, Varanasi 1975.
10. Srinivasan, K. and M. Vlassoff, (editors), Population-Development Nexus in India: Challenges for the New Millennium, Tata McGraw-Hill Publishing Co. Ltd., New Delhi 2001.
11. Ucko, M.J., Ruth Tringham and G.W. Dimbleby (editors), Man, Settlement and Urbanism, Duckworth 1972.

GEOGC105: GEOGRAPHICAL ANALYSIS

Total Marks : 100
Internal Exam Marks : 20 Time: 2 hrs
End Term Exam Marks : 80 Time: 4 hrs
Lecture : 0 Credits Practical: 4 Credits Tutorial: 0 Credits

Unit	Outline
I	Morphometric Analysis: i. Geological cross section ii. Slope & curvature iii. Stream ordering and bifurcation ratio iv. Circulatory and elongation ratio
II	Representation of Climatic data: i. Hythergraph & Ergograph ii. Trend analysis: Rainfall and temperature iii. Water Balance graph iv. Length of growing period
III	Representation of Population and Economic data: i. Population growth ii. Population distribution iii. Population composition iv. Production and distribution of economic data
IV	Settlement analysis i. Rank-size rule ii. Nearest neighbor analysis iii. Network analysis iv. Gravity model and Central place model

Suggested Readings:

1. Bygott, G.L: Mapworks and Practical Geography
2. Mahmood, A. (1977): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
3. Mishra, R.P and Ramesh, A. (1969): Fundamentals of Cartography, Concept Publishing Company, New Delhi.
4. Singh, R.L. and Singh, Rana, P.B. (1991): Elements of Practical Geography, Kalyani Publishers, Ludhiana.
5. Singh, R.L and Singh, R. (1991): Mapwork and Practical Geography, Central Book Depot, Allahabad.
6. Wilkinson, H.R. and Monkhouse, F.J. (1952): Maps and Diagrams, B.I. Publications, Pvt. Ltd, New Delhi.
7. Chorley, R. J., & Haggett, P. (2013). Integrated Models in Geography (Routledge Revivals). Routledge.

GEOGC201: POPULATION GEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Field of Population Geography: i. Nature, Scope and Approaches ii. Relationship with Demography and other social sciences iii. Types and Sources of data iv. Population – Resources Relationship
II	Population Growth and Distribution: i. Population growth trend and distribution ii. Determinants of Population Change: fertility, mortality and migration iii. Population growth and associated issues in Developed and Developing Countries. iv. Depopulation, displacement.
III	Population Theories: i. Malthus ii. Marx iii. Boserup iv. Demographic Transition Model
IV	Population Composition: i. Age and Sex composition ii. Occupational structure iii. Rural – Urban Composition iv. Concept of Ageing

Suggested Readings:

1. Boserup, E. (1965): The conditions of Agricultural Growth, G. Allen and Unwin, London
2. Bhendea, A and Kanitkar, T. (1985): Principles of Population Studies, Himalayan Publishing House, Mumbai.
3. Chandana, R. C. and Sidhu, M. S. (1980): Introduction to Population Geography, Kalyani Publishers, Ludhiana.
4. Clarke, J. L. (1992): Population Geography, Pergamon Press, Oxford.
5. Demko, G. J., Rose, H. M. and Schnell, G. A. (1979): Population Geography: A Reader, Mc Graw Hill, New York.
6. Dubey, R. M. (1981): Population Dynamics in India, Chugh Publications, Allahabad.
7. Mandal, R. B., Uyanga, J and Prasad, H. (1989): Introductory Methods in Population Analysis, Concept Publishing, New Delhi.
8. Sundaram, K. V. and Nangia, S. (1985): Population Geography, Heritage, New Delhi.
9. Samuel H. Preston (2000). Demography: Measuring and modeling population processes, Willey – Blackwell.
10. Thomas Robert Malthus and Geoffrey Gilbert (1999). An Essay on the principles of Population, Oxford University Press, USA.

GEOGC202: ECONOMIC GEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Field of Economic Geography and Resources i. Nature, scope and approaches ii. Concept of resources and classification iii. Mineral and Energy resources: Global perspectives iv. Resource Conservation and Policies
II	Economic Geography of Agriculture i. Types of Agriculture ii. Factors influencing agricultural activities iii. Von Thunen's Agricultural model iv. Place of Agriculture in global economy
III	Economic Geography of Manufacturing i. Types of Industries ii. Factors influencing industrial activities and location iii. Theories of Industrial location: Weber, Losch and Smith iv. Environment and Industrial sustainability
IV	Economic Geography of Transport and Trade i. Role of transport and communication in resource mobilization ii. Modernization of transport and its impact on economy iii. Significance of trade in global and national economy iv. Major trading blocks of the world

Suggested Readings:

1. Agarwal & Monga: Economic Geography
2. Alexander, J. W. (1974): Economic Geography, Prentice Hall
3. Dubey, R. N. & Singh, L: Economic and Commercial Geography
4. Guha and Chattoraj (1971): A New Approach to Economic Geography, Oxford
5. Leong & Morgan: Human and Economic Geography
6. Miller, E. W.: A Geography of Manufacturing, Prentice Hall
7. Singh, B. S.: Geography of Resources
8. Singh, G. S.: Economic and Commercial Geography
9. Singh, J. S.: Agriculture Geography
10. Zimmerman: Economic Geography

GEOGE203: SOCIAL GEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Evolution and relevance: i. Emergence of Social Geography, meaning, scope ii. Significance of social geography iii. Approaches to study of social geography: Positivism, Marxism and post-structuralism iv. Social Geography as an applied branch of human geography
II	Space and Society: i. Concept of social space, social group, social structure, social differentiation, social diversity, and plurality, ii. Social well-being and its indicators, iii. Social segregation, Social Pathology, (caste division of India) iv. Social Action (Indian context)
III	Social problems and Spatial inequalities: i. Patterns in developed and under developed countries ii. Social Space, Social exclusion and Social Justice iii. Social well-being of disadvantaged groups iv. Gender inequality and Social Change (Indian context)
IV	Geographical basis of Social region Formation in India: i. Social diversity and spatial distribution: Tribes, Castes and Linguistic groups ii. Health care, Education and social security iii. Rural-urban divide, rural-urban interaction and social transformation iv. Public Policy and planning

Suggested Readings:

1. Ahmad, Aijazuddin, Social Geography, Rawat Publication, New Delhi, 1999.
2. De Blij. H.D. Human Geography. John Wiley and son, New York.
3. Dreze Jean, Amartya Sen, Economic Development and Social opportunity, Oxford University Press, New Delhi, 1996.
4. Dubey. S.C : Indian Society, National Book Trust, New Delhi, 1991.
5. Gregory, D and J. Larry, (eds.). Social relations and spatial structures, McMillan, 1985.
6. Haq. Mahbubul: Reflections on Human Development, Oxford University Press, New Delhi.
7. Maloney, Clarence: People of South Asia, Winston, New York, 1974. .
8. Planning Commission, Government of India; Report on development of Tribal areas, 1981.
9. Rao, M.S.A.: Urban Sociology in India. Orient longman, 1970.
10. Schwartzberg Joseph; An Historical Atlas of South Asia, University of Chicago Press, Chicago, 1978.
11. Sen, Amartya & Dreze Jean, Indian Development: Selected Regional Perspectives, Oxford University Press, 1996.
12. Smith, David: Geography: A Welfare Approach, Edward Arnold, London, 1977.
13. Sopher, David.: An Exploration of India, Cornell University Press, 1980.
14. Subba Rao. Personality of India; Pre and Proto Historic foundation of India and Pakistan. M.S. University Baroda, Vadodara, 1958.

GEOGC204: REGIONAL PLANNING

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Fundamentals: i. Concept of Region; nature and scope of Regional Planning ii. Types of Regional Planning iii. Role of Regional Planning in National Development iv. Planning regions of India
II	Strategies of Regional Planning: i. Growth Pole, Growth Centres, service centre ii. Economic development and regional development iii. Regional Economic complexes iv. Regional imbalances and inequalities in India
III	Approaches: i. Approaches of Hirschman, Myrdal and growth theories of Perroux, Christaller ii. Approaches to integrated regional planning at different levels: local, regional and national iii. Multi-level planning in India: State, District and Block level planning for tribal, agricultural, industrial and urban (metropolitan) regions iv. Methods and purpose of regionalization
IV	Development perspective: i. Shifting paradigms from Five Year plans to NITI Ayog ii. Backward area development iii. Decentralized planning themes and issues iv. Institutional framework for regional planning: A case study of North-East Region

Suggested Readings:

1. Bernstein, H. (1979): Sociology of Development versus Sociology of Underdevelopment in D. Lehmann (ed.), Development Theory: Four Critical Studies, Cass, London
2. Brookfield, H.C. (1975): Interdependent Development, Methuen, London
3. Cary, J. Hudson, R. and Lewis, J. (ed) (1980): Regions in Crisis, Croom Helm, London.
4. Dewar, D. et al (1986): Regional Development and Settlement Policy, Allen and Unwin, Boston
5. Forbes, D.K. (1984): The Geography of Underdevelopment: A critical survey, Croom Helm, London
6. Hall, P. (1981): Urban and Regional Planning, Allan and Unwin, Boston.
7. Hansen, N.N. (1972): Growth Centres in Regional Economic Development, Macmillan, London
8. Kuklinski, A. (1975): Regional Development and Planning, Sythoff, London
9. Mishra, R.P., K. V. SUndaram and V.L.S.P. Rao (1974): Regional Development Planning in India, Viking, Delhi
10. Stohr, W.B. and Taylor, D.R.F. (1981): Development from above or Development from Below, John Wiley, Chichester.

GEOGC205: QUANTITATIVE TECHNIQUES AND COMPUTER APPLICATION

Total Marks : 100
Internal Exam Marks : 20 Time: 2 hrs
End Term Exam Marks : 80 Time: 4 hrs
Lecture : 0 Credits Practical: 4 Credits Tutorial: 0 Credits

Unit	Outline
I	i. Significance of quantitative techniques in Geography ii. Measures of Central tendencies: Mean, Median and Mode iii. Measures of Dispersion: Mean deviation, Standard deviation iv. Coefficient of Skewness and Quartiles
II	i. Measures of Bivariate: Correlation coefficient ii. Regression and Residuals iii. Time series analysis: Moving average method and Least square method iv. Measures of Inequality: Lorenz curve and Gini's Coefficient
III	i. Chi square (X^2) test ii. 't' test iii. 'f' test iv. ANOVA
IV	i. Basics of Computer ii. Access to open source data and information: Internet/Inflibnet iii. Presentation (PowerPoint) iv. Data Analysis and graphics using Excel, SPSS for statistics

Suggested Readings:

1. Alvi Z. : Statistical Geography, Rawat Bookseller
2. Burt, J. E., Barber, G. M., & Rigby, D. L. (2009). *Elementary statistics for geographers*. Guilford Press.
3. J. Chapman McGrew, Charle: An Introduction to Statistical Problem solving in Geography
4. Mahmood, Aslam (1977): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi
5. Peter A. Rogerson: Statistical Methods for Geography: A Student's Guide

GEOGC301: REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Bases of Remote Sensing: i. Definition and historical development ii. Interaction of Electro-Magnetic Radiation (EMR) with atmosphere and earth surface iii. Satellite and Sensors iv. Concept of Resolution
II	Aerial Photographs and Photogrammetry: i. Types of Aerial photos ii. Fundamentals of air photographs interpretation iii. Geometry of aerial photographs: a. tilt b. relief displacement
III	Digital Image Processing: i. Rectification ii. Restoration iii. Enhancement iv. Classification: unsupervised and supervised
IV	Geographical Information System and GNSS: i. Concepts and data capture ii. Spatial Analysis: single layer, multiple layer iii. Global Navigation Systems (GNSS) iv. Application in Environmental Studies

Suggested Readings:

1. Barret, E.C. and Curtis, L.F. (1976): Introduction to Environmental Remote Sensing, John Wiley and Sons, New York.
2. Camphell, J.B. (1983): Mapping the land, American Association of Geographers, Reprint in India, Scientific Publisher, Jodhpur.
3. Cromley, R. G. (1992). Digital cartography (p. 43). Englewood Cliffs: Prentice Hall.
4. Hyatt E: Remote Sensing
5. Kathuria C.D.: Remote Sensing and Geographical Information System
6. Luder, D. (1959): Aerial Photography Interpretation: Principles and Applications, Mc Graw Hill, New York
7. Markandey K: Urban Environment and Geoinformatics
8. Nag P: Introduction to Geographical Information System.
9. Ramaswamy SM: Remote Sensing in Water Resources
10. Sabins Flyed, F. (1978): Remote Sensing: Principles and Interpretation, San Francisco, WH France

GEOGC302: APPLICATION OF REMOTE SENSING AND GIS

Total Marks : 100
Internal Exam Marks : 20 Time: 2 hrs
End Term Exam Marks : 80 Time: 4 hrs
Lecture : 0 Credits Practical: 4 Credits Tutorial: 0 Credits

Unit	Outline
I	i. Preparation of Base Map ii. Preparation of land use / land cover mapping using stereo pair and Satellite data
II	i. Delineation of litho-unit and rock mass strength ii. Extraction of hydrological features iii. Measurement of Relief tilt displacement
III	i. Georeferencing of maps and images (coordinate & feature based) and Mosaicing ii. Contrast enhancement of Satellite image: Histogram stretch iii. PCA and Band rationing (NDVI, NDWI) iv. Image Classification: Unsupervised and Supervised
IV	i. Digitization: Point, line, polygon layer from maps and images ii. Single layer operation: Proximity analysis, DEM generation, Map slicing iii. Multiple layer operation: Clip, map crossing iv. Thematic map generation and Map query

Suggested Readings:

1. Allan, T.D. (Ed.): Satellite Micro Wave Remote Sensing, Micro Ellis Horwood, Chichester
2. Awry, T.E. & G.L. Berlin: Interpretation of Aerial Photographs (4th ed) Burgers, Minneapolis, Minn.
3. Burrough, P.A. and McDonnel, R.A. (1998): Principles of Geographical Information Systems, Oxford University Press, Oxford.
4. Colwell, R.N.: American Society of Photogrammetry, Manual of Remote Sensing, Vol. I & II, American Society of Photogrammetry, Falls Church, Virginia.
5. Frank, A.U and Campari, I (ed.) (1993): Spatial Information Theory: A Theoretical Bais for GIS.
6. Lillisand, et al. : Remote Sensing and Image Interpretation
7. Lisle, R.J. (1999): Geological Structure and Maps: A Practical Guide, Pergamon Press, New York.
8. Miller, V.C.: Photogeology, Mc Graw Hill, New York

GEOGC303: GEOGRAPHY OF NORTH-EAST INDIA

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Physiographic set up: i. Physiography and drainage ii. Climate and Soil iii. Flora, fauna and biodiversity iv. Changing Physiographical aspects
II	Peopling of North-East India: i. Origin and migration ii. Ethnic composition iii. Linguistic composition iv. Religious composition
III	Society, Economy and Culture: i. Traditional Village Councils ii. Marriage system and status of women iii. Economic aspects and changes iv. Social problems: Migration, unemployment, terrorism and impact of globalization
IV	Arunachal Pradesh: Land and People: i. Physical background ii. Major tribes and their culture iii. Economic activities iv. Continuity and changes of culture

Suggested Readings:

1. Bhagabati, A.K. et al. (2001): Geography of Assam, Rajesh Publications, New Delhi
2. Das, H.P (1972): Geography of Assam
3. Singh, R.L. (ed) (1972): India: A Regional Geography, Varanasi.
4. Taher, M. and Amhed, P. (2001): Geography of North – East India: Mani Manik Prakash, Guwahati

GEOGE304: SOIL GEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Bases of Soil Geography: i. Nature, Scope and Relationship with other Sciences ii. Factors of Soil formation iii. Processes of Soil formation iv. Soil Profile Development under different environment
II	Composition of Soil i. Physical Composition: Structure, Texture, Colour and Pore space ii. Chemical Composition: pH, Organic matter and Clay minerals
III	Soil Classification and Capability: i. Concepts and methods ii. USDA iii. Land Capability / Suitability classification: FAO and
IV	Soil Erosion and conservation i. Erosion: Processes, mechanism and types ii. Methods for assessing Soil erosion (USLE) iii. Soil Conservation: Methods and Techniques

Suggested Readings:

1. Backman, H.O and Brady, N.C. 1960: The Nature and Properties of Soils, Mc Millan New York,
2. Bennet, Hugh H.: Soil Conservation, McGraw Hill, New York .
3. Bunting, B.T. 1973: The Geography of Soils, Hutchinson, London,
4. Clarke G.R. 1957: Study of the Soil in the Field, Oxford University Press, Oxford,
5. Foth H.D. and Turk, L.M 1972.: Fundamentals of Soil science, John Wiley, New York,
6. Govinda Rajan, S.V. and Gopala Rao, H.G. 1978: Studies on Soils of India Vikas, New Delhi,
7. Mc. Bride, M.B. 1999: Environmental Chemistry of Soils, Oxford University Press, New York.
8. Nye, P.H. and Greene, D.J. 1960: The Soil under Shifting Cultivation Commonwealth Bureau of Soil Science, Technical Communication, No. 51; Harpender, England,
9. Raychoudhuri, S.P. 1958: Soils of India, ICAR, New Delhi,
10. Russell, Sir Edward J. 1961: Soil Conditions and Plant Growth, Wiley, New York,

GEOGE305: BIOGEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Concept of Biogeography: i. Concepts, Scope and development ii. Biogeography and related sciences iii. Habitat (Aquatic and Terrestrial) iv. Biodiversity and Hotspots with reference to Eastern Himalayas
II	Phytogeography: i. Factors determining plant growth and distribution ii. Plant community and its vertical stratification iii. Phytogeographic regions of the world iv. Plant succession (Glacial, floodplain and agricultural land)
III	Zoogeography: i. Animal community and its vertical stratification ii. Geographical factors determining growth and distribution of Animals iii. Zoogeographic regions of the world & India iv. Endemic fauna of North East India
IV	Conservation of Plants and Animals: i. Conservation (*in-situ* and *ex-situ*) ii. National Forest Policies: Forest Policy of India 1952 & 1988, Wild Life Protection Act, 1972 and Biodiversity Act, 2002 iii. Conservation organizations: IUCN and WWF iv. Traditional Ecological Knowledge (TEK)

Suggested Readings:

1. Agarwal, D. P. (1992): Man and Environment in India through Ages, Books and Books
2. Andrew Millington: The Sage Handbook of Biogeography, Sage Publications
3. Bradshaw, M. J. (1979): Earth and Living Planet, ELBS, London.
4. Hugget, R. J. (1998): Fundamentals of Biogeography, Routledge, USA.
5. Illies, J. (1974): Introductory to Zoogeography, McMillan, London.
6. Pears, N. (1985): Basic Biogeography, 2nd Edn, Longman, London.
7. Abdurakhmanov, G. M., Myalo, E. G., Ogureeva, G. N. (2014). Biogeography. Textbook for students. Moscow, Academy. pp. 448.
8. Brown, J. H. and Gibson, A.C. (1983). Biogeography. St. Louis: Mosby.
9. Myers, A. A. and Giller, P. S. (1989). Analytical Biogeography: An Integrated Approach to the Study of Animal and Plant Distributions. London: Chapman and Hall.
10. Cox, C. B., Ladle, R. and Moorem, P. D. (2016). Biogeography: An Ecological and Evolutionary Approach. John Wiley & Sons.
11. Gavin, D. G. (2012). Biogeography. in J. P. Stoltman, eds. 21st Century Geography: A Reference Handbook. SAGE Publications, Thousand Oaks, CA. Pages 77-89.
12. Lomolino, M. V., Riddle, B. R., Brown, J. H. and Whittaker, R. J. (2010). Biogeography. Fourth Edition. Sinauer Associates, Sunderland, MA.
13. McCarthy, D. (2011). Here Be Dragons: How the study of animal and plant distributions revolutionized our views of life and Earth. OUP Oxford.

GEOGE306: RURAL DEVELOPMENT

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Fundamentals of Rural Settlement: i. A Geographical perspective of rural development ii. Rural Settlements structure and spatial organization iii. Concepts of integrated rural Land use and settlement planning
II	Dimensions of Rural Sociology: i. Differences in Rural-Urban Sociology and continuum ii. Dichotomy and integration of rural and urban components in health, education and migration iii. Gender Issues in Rural areas
III	Dimensions of Rural Economy: i. Physical and Human Resources ii. Sectoral structure of the rural economy and employment iii. Agriculture, household industries and infrastructural aspects
IV	Rural poverty and under development: i. Concept and measurement of rural poverty ii. Rural development Strategies of India: Case studies of Governmental and other agencies iii. Incidences of Poverty in Indigenous communities and role of Panchayati Raj with special reference to North East and Arunachal Pradesh

Suggested Readings:

1. Boudeville, J.R. (1966): Problems of Regional Economic Planning, Edinburg, University Press Edinburg
2. Bunge, W. (1966): Theoretical Geography, Lund studies in Geography Series, CI, Lund, Gleerup.
3. Chenery, H. et. Al (1974): Redistribution with Growth, Oxford University Press, Oxford
4. Darwent, D.F. (1969): Growth poles and growth centres in regional planning: a review, Environment and Planning
5. Forbes, D. (1982): Geography of Under – development, Croom Helm, London
6. Frank, A.G. (1981): Crisis in the Third World, Heinerman, London
7. Gilbert, A. (ed.) (1976): Development Planning and Spatial Structure, John Wiley, London
8. Hagerstrand, T. (1967) Innovation Diffusion as a Spatial Structure, John Wiley, London
9. Hilhorst, J.G.M (1971) Regional Problems, Macmillan, London

GEOGE307: GENDER GEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Conceptualizing Gender within Geography i. Origin, growth, nature, scope and approaches ii. Gender as a socio-spatial construct , gendered spaces and differentiation iii. Gender theories- Liberal, Marxist, Radical iv. Gender movements in India
II	Status of Women in India: i. Change and continuity ii. Spatial variations, social assignments of work and work preferences iii. Contextualizing Gender in Geography: Various aspects iv. Impact of Environmental changes on role of women
III	Gender roles in Resource Management: i. Land, Water and Forest ii. Women in Formal and Informal sectors: Gender gaps and impacts iii. Gender and Society: Women in social movements iv. Role of Women in changing livelihood situation
IV	Empowering Women in the Regional context: i. Gender Policy measures and practice in India ii. Problems of Women Empowerment and development iii. Perspectives of change among the Rural, Tribal and Scheduled Caste women iv. Role of women in Arunachal Pradesh: Changing dimensions

Suggested Readings:

1. Boserup, E.: Women's Role in Economic Development. Earthscan, London, 1989.
2. Dankelman,I.&Davidson,J. Women and Environment in the Third World Earthscan, London, 1989.
3. Deblig, H.J.: Human Geography-Culture, Society and Space (5th ed.), John Wiley, New York, 1996.
4. Haraway, D.: Simians, Cyborgs and Women-The Reinvention of Nature. Routledge, New York, 1991.
5. Koblinsky, M. et.al (eds.): The Health of Women-A Global Respective. Westview Press, Boulder, 1993.
6. Lee, D.: Women in Geography-A Comprehensive Bibliography. Boca Raton, Florida, 1988.
7. Momsen, J.H. & Townsend, J. (eds.): Geography of Gender in the Third World, Albany, New York, 1987.
8. Montagu, A.: Man's Most Dangerous Myth-the Fallacy of Race. Cleveland, 1964.
9. Reagent, A.C. & Monk J.J. (eds.): Women and Spatial change. Kendell & Hunt, Dubuque, Iowa, 1982.
10. Rhodda, A.: Women and Environment.Zed, London, 1991.
11. Seager, J.&Olson, A.: Women in the world - An International Atlas.
12. Sivant, R.L.: Women-A World Survey. World Priorities Washington, D.C., 1985.
13. United Nations: The World's Women, 1970-1990. United Nations, New York, 1991.
14. United Nations: World Resources 1994-95. Chapter 3: Women and Sustainable Development. United Nations, New York

GEOGO308: GEOGRAPHY OF INDIA

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Physical background: i. Origin of Indian sub-continent ii. Physiography iii. Location significance iv. Climate, soil and vegetation
II	Population of India: i. Ethnic, Linguistic and Religious composition ii. Population distribution and growth iii. Issues of migration, sex ratio and literacy iv. HDI of States and Union Territories
III	Resources: i. Land and Water ii. Minerals and Energy iii. Forest and Wild Life and their conservation iv. Human resources
IV	Agriculture and Industry: i. Agriculture types and characteristics ii. Agricultural regions of India iii. Major types of Industries iv. Industrial regions of India

Suggested Readings:

1. Deshpande C.D India: a Regional Interpretation ICSSR & Northern Book Centre.1992.
2. Dreze, Jean & Amartya Sen (ed.) India Economic Development and Social opportunity: Oxford University Press, New Delhi, 1996.
3. Kundu A. Raza Moonis: Indian Economy: the Regional Dimension. Spectrum Publishers, New Delhi, 1982.
4. Robinson, Francis : The Cambridge Encyclopaedia of India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan & Maldives. Cambridge University Press, London, 1989.
5. Singh R.L. (ed.) : India-A Regional Geography. National Geographical Society, India, Varanasi, 1971.
6. Spate OHK & ATA Learmonth - India & Pakistan Methuen, London. 1967.

GEOGO309: GEOGRAPHY OF TOURISM

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Basics of tourism: i. Definition, nature, scope and historical development ii. Tourism as leisure & recreation iii. Elements, types and forms of tourism iv. Factor influencing tourism: historical, physical, socio-cultural and economic
II	Infrastructure and Support system: i. Transport and communication facilities ii. Accommodation and supplementary accommodation iii. Tourist circuits, travel agencies and tour operators iv. Tour planning and role of guides
III	Tourism in India: i. Tourism potentials in India ii. Places of tourist attraction in North East Region of India iii. Tourism as an Industry in India iv. Positive and negative impacts: Socio-economic, political and environmental
IV	Tourism Development: i. International tourism institutions and organizations ii. Sustainable tourism, problem and prospects iii. National Tourism Policy

Suggested Readings:

1. Bhatia A.K.: Tourism Development: Principles and Practices. Sterling Publishers, New Delhi 1996.
2. Bhatiya, 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. Inskeep. E : Tourism Planning: An Integrated and Sustainable Development Approach, Van Nostrand and Reinhold, New York, 1991.
6. Kaul R.K. Dynamics of Tourism & Recreation. Inter-India, New Delhi. (1985).
7. Robinson, H. A Geography of Tourism. Macdonald and Evans, London, 1996.
8. Sharma J.K. (ed.) : Tourism Planning and Development - A new perspective, Kanishka Publishers, New Delhi, 2000.
9. Shaw G. and Williams A.M. : Critical issues in Tourism-A Geographical Perspective, Oxford: Blackwell, 1994.
10. Sinha P. C. (ed.) : Tourism Impact Assessment, Anmol Publishers, New Delhi, 1998.
11. Voase R.: Tourism: The Human Perspective Hodder & Stoughton, London, 1995.

GEOGO310: APPLICATION OF REMOTE SENSING AND GIS IN ENVIRONMENTAL STUDIES

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Bases of Remote Sensing: i. Definition and historical development ii. Interaction of Electro-Magnetic Radiation (EMR) with atmosphere and earth surface. iii. Sensors and data products.
II	Digital Image Processing: i. Restoration ii. Enhancement iii. Classification: Supervised and unsupervised.
III	Geographical Information System and GPS: i. Concepts and data capture ii. Global Positioning Systems (GPS) iii. Data model and Topology iv. Spatial analysis
IV	Application of Remote Sensing and GIS: i. Forestry and Life Sciences ii. Planning and Development iii. Public Utility / Infrastructure iv. Disaster Management

Suggested Readings:

1. Barret, E.C. and Curtis, L.F. (1976): Introduction to Environmental Remote Sensing, John Wiley and Sons, New York.
2. Camphell, J.B. (1983): Mapping the land, American Association of Geographers, Reprint in India, Scientific Publisher, Jodhpur.
3. Hyatt E: Remote Sensing
4. Kathuria C.D.: Remote Sensing and Geographical Information System
5. Luder, D. (1959): Aerial Photography Interpretation: Principles and Applications, Mc Graw Hill, New York
6. Markandey K: Urban Environment and Geoinformatics
7. Nag P: Introduction to Geographical Information System.
8. Ramaswamy SM: Remote Sensing in Water Resources
9. Robert: Digital Cartography
10. Sabins Flyed, F. (1978): Remote Sensing: Principles and Interpretation, San Francisco, WH France

GEOGC401: MOUNTAIN GEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Mountain Ecosystem: i. Distribution of major mountains of the world ii. Characteristics of mountain ecosystem: Topography, climate, soil and vegetation iii. Altitudinal / vertical zones iv. Bioclimatic belts
II	Case studies of Mountain Ecosystems: i. The Alps ii. The Andes iii. The Appalachians iv. The Himalayas special reference to the Eastern Himalayas
III	Human Adaptation to Mountain Ecosystem: i. Physiological adaptation ii. Agriculture and pastoralism iii. Housing iv. Food habits and Dress
IV	Constraints of Mountain Ecosystem: i. Inaccessibility ii. Mountain hazards: Landslides and Avalanches iii. Deforestation and Soil erosion iv. Climate change and its impact

Suggested Readings:

1. A.S Rawat : Alternative Farming system in Dry Temperate Zone of Himachal: Study of Kinnaur District, Indus publishing.
2. Harish Kapadia : Across Peaks and Passes in Darjeeling & Sikim, , Indus publishing
3. Prem Singh Jina Ladakh : Land and people, Indus publishing .
4. H.C Pokhriyal : Agrarian Economy of Central Himalaya, Indus publishing .
5. P.N Pande : Drudgery of the Hill Women, Indus publishing company.
6. Vir Singh & M.L Sharma (Eds): Mountain Ecosystem: A scenario of Unsustainability, Indus publishing .
7. B.D Sharma & Tej Kumari Sharma (Eds) : Himalayan Natural Resources, Indus publishing.

GEOGC402: SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL IMPACT ASSESSMENT

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Concepts of Sustainable Development i. Population Growth, Economic Development and their impact on Environment ii. History of Sustainable Development: Brundtland, Rio summit, Paris declaration iii. Basic Concepts, Strategies and Measurement iv. Efficiency and Innovation, Green Growth and Rebound
II	Major Issues: i. Sustainable Mountain Agriculture ii. Community Participation in Development Projects iii. Integrated Watershed Development iv. Grassroot Planning
III	Development Goals i. Sustainable Development Goals ii. Millennium Development Goals
IV	Environmental Impact Assessment i. Screening, Scoping, Baseline Studies ii. Index Approach iii. Multi Attribute Theory iv. Sound Ecological Principles

Suggested Reading:

Bass, S., & Dalal-Clayton, B. (2012). Sustainable development strategies: a resource book. Routledge

Roorda, N. (2017). Fundamentals of sustainable development. Routledge.

Rogers, P. P., Jalal, K. F., & Boyd, J. A. (2012). An introduction to sustainable development. Routledge.

Elliott, J. (2012). An introduction to sustainable development. Routledge.

Brebbia, C. A. (2013). Sustainable Development and Planning VI (Vol. 173). Wit Press

Petts, J. (Ed.). (2009). Handbook of Environmental Impact Assessment: Volume 2: Impact and Limitations (Vol. 2). John Wiley & Sons.

Carroll, B., Fothergill, J., Murphy, J., & Turpin, T. (2019). Environmental impact assessment handbook: A practical guide for planners, developers and communities. ICE Publishing.

Pradhan, P., Costa, L., Rybski, D., Lucht, W., & Kropp, J. P. (2017). A systematic study of Sustainable Development Goal (SDG) interactions. Earth's Future, 5(11), 1169-1179.

McGillivray, M. (Ed.). (2008). Achieving the millennium development goals. Springer.

Assembly, G. (2015). sustainable Development goals. SDGs), Transforming our world: the, 2030.

GEOGE403: HYDROLOGY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Bases of Hydrology: i. Concepts and scope of hydrology ii. Hydrological cycle iii. Water balance concept and equation iv. Hydrology in relation to water resources development
II	Surface water hydrology: i. Hydrological cycle in drainage basin ii. Runoff and Basin Yield iii. Surface runoff generation iv. Surface water resources of India
III	Ground water hydrology: i. Lithology and its hydrological properties ii. Type of aquifers and Ground water movement iii. Recharge and discharge of groundwater iv. Ground water resources of India
IV	Problems and Conservation of Water Resources: i. Conjunctive use of ground water ii. Impact of climate change on water resources iii. Water Conservation strategies – traditional and modern iv. National Water Policy

Suggested Readings:

1. Addison, H. Land Water and Flood, Chapman and Hall, London 1961.
2. Chorley, R.J. (ed) : Introduction to Physical Hydrology, Methuen, London.1969
3. Chorley,R.J.: Water, Earth and Man,methuen,London,1967.
4. Dakshinamurthy, C .et al., Water Resources of India and Their utilisation in Agriculture, Indian Agriculture Research Institute, New Delhi,1973.
5. Jones, J.A.A : Global Hydrology: Processes, Resources and Environmental Management, Longman,London,1997.
6. Matter , J.R., Water Resources. Distribution, Use and Management, John Wiley, Marylane,1984.
7. Singh, R.A. and Singh, S.R.: Water Management: Principles and Practices. Tara Publication, Varanasi, 1972.
8. Todd, D.K.: Ground Water Hydrology, John Wiley, New York,1959.

GEOGE404: GEOGRAPHY OF LANDFORMS

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Bases of Geography of Landform i. Nature and scope ii. Geomorphic Concepts: process - response, feedback mechanism iii. Landform in relation to endogenetic and exogenetic processes iv. Landform classification
II	Weathering processes: i. Factors influencing weathering processes ii. Weathering and landform development iii. Weathering front, profile, depth and water table
III	Surface material and landform: i. Rocks and landforms ii. Relationship between landform and soil iii. Soil landscape mapping
IV	Applied Landform Geography i. Planning and management of land resources ii. Terrain evaluation: concepts and application iii. Geomorphic hazards

Suggested Readings:

1. Bloom, A.L. (1978) : A Systematic Analysis of late Cenozonic Landforms, Englewed Cliffs, M.J. Prentice Hall.
2. Embleton, C. and J. Thornes : Processes in Geomorphology, London, Edward Arnold.
3. Goudie, A. (ed.) (1990): Geomorphological Techniques. London, George Unwin and Hyman.
4. Hart, M.G. (1986) : Geomorphology : Pure and Applied, George Allen and Unwin, London.
5. Holmes, A. : Principles of Physical Geology, 3rd Edn. London . Nelson. 1978.
6. King, C.A. M. : Techniques in Geomorphology : London : Edward Arnold.
7. Leopold, L.B. : Fluvial Processes in Geomorphology.
8. Pitty, A.F. : Geomorphology and Rural Settlement in India.
9. Scheidegner, A.E. : Theoretical Geomorphology. Berlin : Springer – Verlag.
10. Sharma, V.K. : Process in Geomorphology (Mc Graw Hill).
11. Thorn, C.E. : Introduction to Theoretical Geomorphology.
12. Thornbury, W.D. : Principles of Geomorphology. New York : Wiley (1969).

GEOGE405: GEOMORPHIC MAPPING AND HYDROLOGICAL DATA ANALYSIS AND FIELD REPORT

Total Marks : 100
Internal Exam Marks : 20 Time: 2 hrs
End Term Exam Marks : 80 Time: 4 hrs
Lecture : 0 Credits Practical: 4 Credits Tutorial: 0 Credits

Unit	Outline	
I	i. Geomorphic Mapping using NATMO Scheme ii. Basin Delineation from DEM, Slope Curvature, TPI, TWI iii. Trend Surface Analysis, residuals and geomorphological field correlates iv. Soil sampling, soil pH, texture, moisture: spatial modelling	2 credits Compulsory
II	i. Analysis of stage, discharge and sediment flow determination of return period ii. Preparation of hydromorphogeological mapping based on field work in the nearby area iii. TSI, HSI	
III	i. Significance of field work in Geography ii. Identification of Research Problem iii. Sources of data and sampling iv. Data analysis	2 credits Compulsory
IV	Field visit and Project Report The project report is based on supervised field work for appropriate duration, which will be conducted in appropriate place. The Teacher in-charge is to select a suitable study area in advance and conduct the survey for the collection of primary / secondary data.	

Suggested Reading:

1. Boulding, J. R., & Ginn, J. S. (2016). Practical handbook of soil, vadose zone, and ground-water contamination: assessment, prevention, and remediation. CRC Press.
2. Florinsky, I. (2016). Digital terrain analysis in soil science and geology. Academic Press.
3. Goudie, A. (2003). Geomorphological techniques. Routledge.
4. Gregory, K. (1980). Updating geomorphology: Practical Fieldwork in Hydrology If It Moves, Measure It!. Teaching Geography, 5(4), 170-174.
5. Handbook of Applied Hydrology: McGraw-Hill, New York, 4-39.
6. Lindsay, J. B. (2005). The terrain analysis system: A tool for hydro-geomorphic applications. Hydrological Processes: An International Journal, 19(5), 1123-1130.
7. Nag, P., & Saha, G.N. (1996). Geomorphological Mapping: Perspectives & dimensions (Vol 13).
8. National Atlas and Thematic Mapping Organisation, Department of Science and Technology, Govt. of India.
9. Prasad, Har (1992). Research Methods and Techniques in Geography, Rawat Publishers, Jaipur.
10. Smith, M. J., Paron, P., & Griffiths, J. S. (2011). Geomorphological mapping: methods and applications (Vol. 15). Elsevier.
11. Strahler, A. N. (1964). Part II. Quantitative geomorphology of drainage basins and channel networks.
12. Wilson, J. P., & Gallant, J. C. (Eds.). (2000). Terrain analysis: principles and applications. John Wiley & Sons.

GEOGE406: PHYTOGEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Fundamentals i. Meaning, scope and development. ii. Concept of Ecology and Ecosystem. iii. Plant colonization and dispersal. iv. Plant speciation and extinction.
II	Determinants of plant growth and distribution i. Topographic Factors: Slope, Aspect, Altitude. ii. Climatic Factors: Light, Temperature, precipitation. iii. Edaphic Factors: Soil pH, moisture and texture. iv. Biotic Factor: Interactions between plants and animals.
III	Characterizing biotas and Conservation planning i. Conservation status, diversity indices and patterns. i. Eco-regions, endemism, threatened species. ii. Conservation units and ecosystem services.
IV	Species distribution modeling i. Types of species distribution modeling. ii. Presence- only data vs. presence-absence data. iii. Bioclimatic modeling. iv. Habitat suitability analysis.

Suggested Readings:

1. Abdurakhmanov, G. M., Myalo, E. G., Ogureeva, G. N. (2014). Biogeography. Textbook for students. Moscow, Academy. pp. 448.
2. Brown, J. H. and Gibson, A.C. (1983). Biogeography. St. Louis: Mosby.
3. Myers, A. A. and Giller, P. S. (1989). Analytical Biogeography: An Integrated Approach to the Study of Animal and Plant Distributions. London: Chapman and Hall.
4. Cox, C. B., Ladle, R. and Moorem, P. D. (2016). Biogeography: An Ecological and Evolutionary Approach. John Wiley & Sons.
5. Gavin, D. G. (2012). Biogeography. in J. P. Stoltman, eds. 21st Century Geography: A Reference Handbook. SAGE Publications, Thousand Oaks, CA. Pages 77-89.
6. Lomolino, M. V., Riddle, B. R., Brown, J. H. and Whittaker, R. J. (2010). Biogeography. Fourth Edition. Sinauer Associates, Sunderland, MA.
7. McCarthy, D. (2011). Here Be Dragons: How the study of animal and plant distributions revolutionized our views of life and Earth. OUP Oxford.
8. Molles, M. C. (1999). Ecology: Concepts and Applications. WCB/McGraw-Hill.
9. Pielou, E. C. (1974). Population and Community Ecology: Principles and Methods. Gordon and Breach.
10. Kumaresan, V. and Arumugam, N. (2016). Plant Ecology and Phytogeography. Sara Publication, Nagercoil, Tamil Nadu.
11. Franklin Janet (2009). Mapping Species Distributions: Spatial inference and prediction. Cambridge University Press, United Kingdom.

GEOGE407: ZOOGEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Fundamentals i. Meaning, scope and development ii. Concept of Ecology and Ecosystem iii. Species distribution and dispersal iv. Speciation, Glaciations and Continental drift
II	Determinants of animal growth and distribution i. Climatic Factors: Light, Temperature ii. Edaphic Factors: Soil pH, Mineral Nutrients iii. Biotic Factors: Interactions between plants and animals iv. Others Factors: Breeding sites, Water and Food supply
III	Characterizing biotas and Conservation planning i. Conservation status, diversity indices and patterns. ii. Eco-regions, endemism, threatened species iii. Conservation units and ecosystem services iv. Global conservation assessments, reserve networks and surrogates
IV	Species distribution modeling i. Types of species distribution modeling ii. Presence-only data vs. presence-absence data iii. Bioclimatic modeling iv. Habitat suitability analysis

Suggested Readings:

1. Abdurakhmanov, G. M., Myalo, E. G., Ogureeva, G. N. (2014). Biogeography. Textbook for students. Moscow, Academy. pp. 448.
2. Brown, J. H. and Gibson, A.C. (1983). Biogeography. St. Louis: Mosby.
3. Myers, A. A. and Giller, P. S. (1989). Analytical Biogeography: An Integrated Approach to the Study of Animal and Plant Distributions. London: Chapman and Hall.
4. Cox, C. B., Ladle, R. and Moorem, P. D. (2016). Biogeography: An Ecological and Evolutionary Approach. John Wiley & Sons.
5. Gavin, D. G. (2012). Biogeography. in J. P. Stoltman, eds. 21st Century Geography: A Reference Handbook. SAGE Publications, Thousand Oaks, CA. Pages 77-89.
6. Lomolino, M. V., Riddle, B. R., Brown, J. H. and Whittaker, R. J. (2010). Biogeography. Fourth Edition. Sinauer Associates, Sunderland, MA.
7. McCarthy, D. (2011). Here Be Dragons: How the study of animal and plant distributions revolutionized our views of life and Earth. OUP Oxford.
8. Molles, M. C. (1999). Ecology: Concepts and Applications. WCB/McGraw-Hill.
9. Pielou, E. C. (1974). Population and Community Ecology: Principles and Methods. Gordon and Breach.
10. Beddard, F. E. (1895). A Textbook of Zoogeography. Cambridge University Press, United Kingdom.
11. Franklin Janet (2009). Mapping Species Distributions: Spatial inference and prediction. Cambridge University Press, United Kingdom.

GEOGE408: PRACTICAL AND FIELD REPORT

Total Marks : 100
Internal Exam Marks : 20 Time: 2 hrs
End Term Exam Marks : 80 Time: 4 hrs
Lecture : 0 Credits Practical: 4 Credits Tutorial: 0 Credits

Unit	Outline	
I	i. Plant survey techniques a. Quadrate b. Transect c. Soil Analysis ii. Animal Survey techniques a. Transect b. Point Count c. Call Count	2 credits Compulsory
II	i. Species Distribution Models ii. Maximum Entropy (MAXENT) iii. Habitat Suitability Analysis: Analytic Hierarchical Process	
III	i. Significance of field work in Geography ii. Identification of Research Problem iii. Sources of data and sampling iv. Data analysis	2 credits Compulsory
IV	Field visit and Project Report The project report is based on supervised field work for appropriate duration, which will be conducted in appropriate place. The Teacher in-charge is to select a suitable study area in advance and conduct the survey for the collection of primary / secondary data.	

Suggested readings:

1. Anderson, D. R., Laake, J. L., Cran, B. R. and Burnham, K. P. (1979). Guidelines for line transect sampling of biological populations. *Journal of Wildlife Management*, **43**: 70–78.
2. Bookhout, T. A. (1994). Research and management techniques for wildlife and habitats. The Wildlife Society, Bethesda, Maryland. pp. 740
3. Barbour, M. G., Burk, J. H. and Pitts, W.D. (1987). Terrestrial Plant Ecology. Chapter 9: Method of sampling the plant community. Menlo Park, CA: Benjamin/Cummings Publishing Co.
4. Eberhardt, L. L. and Thomas, J. M. (1991). Designing Environmental Field Studies. *Ecological Monographs*, **61**(1): 53-73.
5. Knapp, R. (1984). Sampling methods and taxon analysis in vegetation science. Handbook of Vegetation Science 1. Part 4. Hague, The Netherlands.
6. Franklin Janet (2009). Mapping Species Distributions: Spatial inference and prediction. Cambridge University Press, United Kingdom.
7. Mishra, H.N. and Singh V.P. (ed) (1998), Research Methodology: Social, Spatial and Policy Dimensions, Rawat Publishers, Jaipur.
8. Prasad, Har (1992). Research Methods and Techniques in Geography, Rawat Publishers, Jaipur.

GEOGE409: AGRICULTURAL GEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr

End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Fundamentals: i. Nature, scope, significance and Development of Agricultural Geography ii. Origin and spread of Agriculture iii. Approaches: Commodity, Systematic, Regional, Deterministic iv. Factors affecting Agriculture: a. Physical: Topography, climate and soil b. Socio-economic factors c. Institutional and Technological factors
II	Models in Agricultural Geography: i. Models to determine the use of land ii. Locational models: Jonasson's model iii. Game Theory and Decision making model iv. Combinational and Land carrying capacity
III	Agricultural Regionalization: i. Statistical Analysis: Crop concentration, crop diversification, Crop Specialization and Intensity of Crop ii. Whittlessey's Classification of Agricultural System iii. Agro-climatic regions of India
IV	New perspectives in Agriculture Development: i. Sustainable Agriculture Development and Poverty Alleviation ii. Green revolution and Regional Pattern of Productivity in India iii. Food security and National Agriculture Policy iv. Population Growth, Food supply, Nutrition and Hunger in India

Suggested Reading:

1. Basu, D. N. and Guha, G. S. 1996: Agro-Climtic Regional Planning in India, Vol. I & II, Concept Publication, New Delhi.
2. Bryant, C.R., Johnston, T.R, 1992: Agriculture in the City Countryside, Belhaven Press,London.
3. Buller, N. and Hoggart, K. (eds.) 2001: Agricultural Transformation, Food and Environment, Vol. I, Ashgate Publishing Company, Burlington.
4. Burch, D., Gross, J. and Lawrence, G. (eds.) 1999: Restructuring Global and Regional Agriculture, Ashgate Publishing Company, Burlington.
5. Burger, A. 1994: Agriculture of the World, Aldershot, Avebury.
6. Grigg, D.B., 1984: Introduction to Agricultural Geography, Hutchinson, London.
7. Hussain, M. (2006): Systematic Agricultural Geography, Reprinted, Rawat Publications, Jaipur.
8. Singh, J. and Dhillon, S.S., 2004: Agricultural Geography, 3rd Edition, Tata McGraw Hill, New Delhi.

GEOGE410: MANAGING DISASTER IN NORTH EAST INDIA

Total Marks : 100

Internal Exam Marks : 20 Time: 1 hr
End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Understanding Hazards both Natural and Manmade: i. Earth Quake, Flash Flood ii. Landslides, Forest Fire, Pest Infection iii. Fire hazards, Pollution, Chemical disaster iv. Accidents: Road, Rail and water ways
II	Response to Disaster and Vulnerability Analysis: i. Components of Response: Response Plan, Communication and Action, Logistics ii. Damage Assessment; Stakeholders: Local, District, State and Centre iii. Disaster Medicine: Epidemiology, Medical preparedness plan iv. Site management, Clinical Casualty Management
III	Relief and Rehabilitation: i. Relief and Rehabilitation as a means for development ii. Development of Physical Infrastructure iii. Economic Rehabilitation iv. Psychological Rehabilitation
IV	Disaster Preparedness: i. Prevention as a technique for Mitigation ii. Preparedness for people with special needs, Vulnerable groups: Women, Children, Senior Citizen and Livestock iii. Role of Police, Military forces, NSS, Scouts, NGO's Media iv. IT in DP with special reference to GIS, Remote Sensing, Landuse Planning

Suggested Reading:

1. Allan, S., Adam,B and Carter,C., (ed) 2000: Environmental Risks and the Media, Routledge, London
2. Burton,I, Kates, R.W and White, G.F., (1993): Environment as Hazards, 2nd Edition, Guilford Press, New York
3. Cantledge, B (ed), 1992: *Monitoring the Environment*, Oxford University Press, Oxford.
4. Hewitt, K. 1997, Regions of Risk: A geographical Introduction to Disasters, Longman, London
5. Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Pub., New Delhi
6. Schneid, T and Collins, L. (1998): Disaster Management and Preparedness, Lewis Publishers, Washington, D.C.
7. Singh, R. B. (ed.) (2006) National Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Pub, New Delhi
8. Singh , J (2007) " Disaster Management Future Challenges and Opportunities", 2007. I. K. Publisher International Pvt. Ltd. S-25, Green Park Extension, New Delhi
9. Paraswamam,S and Umikrishnan, P.V. (2000); India Disaster Report, Oxford University Press, New Delhi

GEOGE411: REGIONAL ANALYSIS AND FIELD REPORT

Total Marks : 100
Internal Exam Marks : 20 Time: 2 hrs

End Term Exam Marks : 80 Time: 4 hrs
Lecture : 0 Credits Practical: 4 Credits Tutorial: 0 Credits

Unit	Outline	
I	i. Mapping of rural inequalities: income and social well being by Z-score ii. Social area analysis by Principal Component Analysis iii. Delimiting influence area of nodal centers using: a. Breaking point method b. Gravity potential method	2 credits Compulsory
II	i. Regionalisation using methods of : a. Overlapping of different themes b. Ranking using mean and standard deviation c. Factor analysis ii. Application of aggregate connectivity for regional Development using alpha, beta, gamma and cyclomatic number	
III	i. Significance of field work in Geography ii. Identification of Research Problem iii. Sources of data and sampling iv. Data analysis	2 credits Compulsory
IV	Field visit and Project Report The project report is based on supervised field work for appropriate duration, which will be conducted in appropriate place. The Teacher in-charge is to select a suitable study area in advance and conduct the survey for the collection of primary / secondary data.	

Suggested Readings:

1. Alam, S. M. et al., 1982: Settlement Systems of India, Oxford and IBH Publishing Co., New Delhi.
2. Bhat, L. S., 1976: Micro-Level Planning: A Case Study of Karnal Area, Haryana, Concept Publishing
3. Blaikie, P.C Mo..,, N19e7w1 :D Seplhait.i al Organisation of Agriculture in North Indian Village, Trans. Inst. British Geographer, Vol. 50.
4. Chisholm, M., 1966: Geography of Economics, Bell, London. Chisholm, M., 1967: Rural Settlements and Land Use, John Wiley, New York. Chorley, R. J. and
5. Hagget, P., 1967: Models in Geography, Methuen, London. Christaller, W.: The Central Places in Southern Germany, Translated by C.W. Baskin,
6. Mishra, H.N. and Singh V.P. (ed) (1998), Research Methodology: Social, Spatial and Policy Dimensions, Rawat Publishers, Jaipur
7. Prasad, Har (1992). Research Methods and Techniques in Geography, Rawat Publishers, Jaipur.

GEOGE412: URBAN GEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr

End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Introduction: i. Development of Urban Geography as a systematic discipline : Nature, scope, approaches and recent trends ii. Urban Morphology and Land Use Pattern iii. Classical Models of Urban Land use: Concentric Model, Sectoral Model; Multiple nuclei model- formulation, salient features and critical evolutions of models iv. CBD- Meaning, internal structure, characteristic features and delineation method
II	City Surrounding Relations: i. The Urban economic base concept: Basic and Non Basic ii. The City's spheres of influence (Umland)- methods of its determinations iii. Rural-urban fringe: Conceptual explanations, Internal Structure, and its characteristics iv. Urban Renewal- Gentrification
III	Settlement Theories and concepts : i. Christaller's Central Place Theory ii. Losch's Theory of settlement iii. Rank-size rule and Law of Primate city iv. Concept of Urban System: Urban, Urbanization, Urbanism, urban ecology and Smart City
IV	The Urban Environment: i. Trends and spatial pattern of Urbanization and its problem with reference to India ii. The Social Environment of the City: Social Stratification, Social Class, Diversity, Poverty, Crime and Homelessness iii. Urban Environment Problems: Heat Island, Drainage, Sewerage, Sanitation, Traffic congestion, Pollution and Health iv. National Policies of Urbanization, 74th Constitutional Amendment.

Selected Readings:

1. Berry, B.J.L. and Horton F.F. Geographic Perspectives on Urban Systems, Prentice Hall, Englewood Cliffs, New Jersey, 1970.
2. Carter: The Study of Urban Geography, Edward Arnold Publishers, London, 1972.
3. Chorley, R.J.O., Haggett P. (ed.): Models in Geography, Methuen, London, 1966.
4. Dickinson, R.E.: City and Region, Routledge, London, 1964.
5. Dwyer, D.J. (ed.) The City as a Centre of Change in Asia, University of Hong Kong Press, Hongkong, 1971.
6. Gibbs J.P.: Urban Research Methods D. Van Nostrand Co. Inc. Princeton, New Jersey, 1961.
7. Hauser, Philip M. and Schnore Leo F. (ed.): The Study of Urbanisation, Wiley, 1965.
8. James, P.E. and Jones C.F. (eds.): American Geography, Inventory and Prospect, Syracuse University Press, Syracuse, 1954.
9. Kundu, A. : Urban Development and Urban Research in India, Khanna Publication, 1992.
10. Meyor, H.M. Kohn C.F. (eds.): Readings in Urban Geography, University of Chicago Press, 1955.

11. Nangia, Sudesh Delhi Metropolitan Region: A study in settlement geography, Rajesh Publication, 1976.
12. Rao V.L.S.P. :Urbanisation in India: Spatial Dimensions. Concept Publishing Co. New Delhi
13. Rao VL.S.P.: The Structure of an Indian Metropolis: A study of Bangalore
14. Singh K and Steinberg F. (eds.): Urban India in Crisis, New Age Interns, New Delhi, 1998.

GEOGC413: CULTURAL GEOGRAPHY

Total Marks : 100
Internal Exam Marks : 20 Time: 1 hr

End Term Exam Marks : 80 Time: 3 hrs
Lecture : 4 Credits Practical: 0 Credits Tutorial: 0 Credits

Unit	Outline
I	Introduction: i. Definition and development of cultural geography. ii. Themes and concepts in cultural geography a. cultural history b. cultural landscape and cultural ecology c. cultural diffusion d. cultural integration.
II	Evolution and growth of Cultural groups: i. Evolution and Growth of Cultural Groups ii. Identity formation: role of Race, language, religion and ethnicity iii. Spatial distribution towards beginning of Cultural Practices, and, iv. Patterns of world cultural regions
III	Cultural changes: i. Various economic activities & cultural adaptations ii. Agriculture, industrialization and development iii. Impact of Globalization and Cultural continuity iv. Concept of Modernization Transformations and Changes.
IV	Bases of Cultural Diversity in India: i. Origin, and Spatial distribution of Race, Language and Religion ii. Geographical factors as bases of Cultural diversity iii. Factors in formation of areas of attraction, isolation and nucleation in integration of India iv. Cultural regions of India

Suggested Readings:

1. Basham, A.L. The Wonder that was India, Picador, India,
2. Broek, J.C. and Webb, J.W: A Geography of Mankind, McGraw Hill, New York, 1978.
3. Crang, Mike: Cultural Geography, Routledge publicatins, London,1998.
4. Harmandorf, Tribes of India: The Struggle for Survival, Oxford University Press, Delhi,1989.
5. Hazra, (ed.), Dimensions in Human Geography, Rawat Publication, Jaipur, 1997.
6. Hutchinson, and Smith, D: Ethnicity; Oxford University press, Oxford,1996.
7. Jordon, & Lester G: The Human Mosaic, Harpar& Row, New York; 1979.
8. Kosambi, D.D. 1992, The Culture and Civilization of Ancient India in Historical Outline, Vikash Publishing, New Delhi
9. Massey, D & Jess P. A Place in the World: Places, Cultures and Globalization Oxford University, New York, 1995.
10. Massey, et.al (ed), Human Geography Today, Polity Press, Combridge, 1999.
11. Mukherjee, A.B. and Aijazuddin, A: India: Culture, society and Economy, Inter-India Publication, New Delhi, 1985.
12. Steve.P&Michael.K (ed): Places and the Politics of Identify, Routledge, London, 1993.
13. Schwartzberg, J.E: Historical Atlas of South Asia, University of Chicago, 1978.

GEOGE414: ANALYSIS OF URBAN, CULTURAL AND GENDER DIMENSION AND PROJECT REPORT

Total Marks : 100
Internal Exam Marks : 20 Time: 2 hrs
End Term Exam Marks : 80 Time: 4 hrs
Lecture : 0 Credits Practical: 4 Credits Tutorial: 0 Credits

Unit	Outline
I	i. Rank size distribution and correlation between associated variables ii. Quality of life index for urban residential areas iii. Urban expansion mapping iv. Mapping of urban land use and land cover
II	i. Determination of concentration of Tribes and other communities by using location quotient and 'Z' score ii. Lorenz curve and Ginni Coefficient iii. Combination of Tribes by using Weaver's Combination technique iv. Preparation of thematic maps and comparative data analysis based on religion data
III	i. Gender Disparity Index using Sopher's method ii. Mapping the countries with high, medium and low gender disparity (HDR) iii. Developing gender disparity divide in India (HDR) iv.

PROJECT REPORT (50 Marks)

Unit	Outline	
I	Field visit and Project Report The project report is based on supervised field work for appropriate duration, which will be conducted in appropriate place. The Teacher in-charge is to select a suitable study area in advance and conduct the survey for the collection of primary / secondary data.	2 credits Compulsory

Suggested Readings:

1. Har Prasad (1992): Research Methods and Techniques in Geography, Rawat Publishers, Jaipur.
2. Mishra, H.N. and Singh V.P. (ed.) (1998), Research Methodology: Social, Spatial and Policy Dimensions, Rawat Publishers, Jaipur.
3. Goode and Hat, Research Methodology in Social Sciences, Oxford University Press, New Delhi.
4. Black James A and D.J. champion (1976): Methods and Issues in social Research, New York, Jolm Wiley and Sons, Inc.
5. Young, PV. An introduction to research methodology.
6. Mishra, H.N. and Singh V.P. (ed) (1998), Research Methodology: Social, Spatial and Policy Dimensions, Rawat Publishers, Jaipur
7. Prasad, Har (1992). Research Methods and Techniques in Geography, Rawat Publishers, Jaipur.