

UNIVERSITY OF KALYANI

**Syllabus for B.A./B.Sc. (Honours)
in
Geography**

**According to the
Choice Based Credit System (CBCS)
&
Semester System: I-VI**

WITH EFFECT FROM THE ACADEMIC SESSION

2018-2019

COURSE STRUCTURE UNDER CHOICE BASED CREDIT SYSTEM FOR B.A./B.Sc.
HONOURS IN GEOGRAPHY

Semester-wise course structure

(6 Credit: 75 Marks)

SEMESTER-I				
Course Code	Course Nature	Course Title	Course wise Class (L+T+P)	Credit
GEO/H/CC/T/01	Core	GEOTECTONICS AND GEOMORPHOLOGY	75L+15T	6
GEO/H/CC/T/02	Core	CARTOGRAPHIC TECHNIQUES AND GEOLOGICAL MAP STUDY	60T	4
GEO/H/CC/P/02			60P	2
GEO/H/GE/T/01/A or GEO/H/GE/T/01/B	GE	DISASTER MANAGEMENT OR GEOGRAPHY OF TOURISM	75L+15T	6
-	AECC	Environmental studies	-	2
Total		4 courses	-	20
SEMESTER-II				
Course Code	Course Nature	Course Title	Course wise Class (L+T+P)	Credit
GEO/H/CC/T/03	Core	HUMAN GEOGRAPHY	75L+15T	6
GEO/H/CC/T/04	Core	CARTOGRAMS, SURVEY AND THEMATIC MAPPING	60T	4
GEO/H/CC/P/04			60P	2
GEO/H/GE/T/02/A or GEO/H/GE/T/02/B	GE	GEOSPATIAL TECHNOLOGY OR REGIONAL DEVELOPMENT	75L+15T	6
-	AECC	Communicative English/ MIL	-	2
Total		4 courses	-	20
SEMESTER-III				
Course Code	Course Nature	Course Title	Course wise Class (L+T+P)	Credit
GEO/H/CC/T/05	Core	CLIMATOLOGY	75L+15T	6
GEO/H/CC/T/06	Core	STATISTICAL METHODS IN GEOGRAPHY	60T	4
GEO/H/CC/P/06			60P	2
GEO/H/CC/T/07	Core	GEOGRAPHY OF INDIA	75L+15T	6
GEO/H/GE/T/03/A or GEO/H/GE/T/03/B	GE	CLIMATE CHANGE: VULNERABILITY AND ADAPTATION OR RURAL DEVELOPMENT	75L+15T	6
GEO/H/SEC/P/01/A or GEO/H/SEC/P/01/B	SEC	COMPUTER BASIC AND COMPUTER APPLICATIONS OR REMOTE SENSING	60P	2
Total		5 courses	-	26

COURSE STRUCTURE UNDER CHOICE BASED CREDIT SYSTEM FOR B.A./B.Sc.
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(6 Credit: 75 Marks)

SEMESTER-IV				
Course Code	Course Nature	Course Title	Course wise Class (L+T+P)	Credit
GEO/H/CC/T/08	Core	REGIONAL PLANNING AND DEVELOPMENT	75L+15T	6
GEO/H/CC/T/09	Core	ECONOMIC GEOGRAPHY	75L+15T	6
GEO/H/CC/T/10	Core	ENVIRONMENTAL GEOGRAPHY	60T	4
GEO/H/CC/P/10			60P	2
GEO/H/GE/T/04/A or GEO/H/GE/T/04/B	GE	INDUSTRIAL GEOGRAPHY OR SUSTAINABLE DEVELOPMENT	75L+15T	6
GEO/H/SEC/P/02/A or GEO/H/SEC/P/02/B	SEC	ADVANCE SPATIAL STATISTICAL TECHNIQUES OR FIELD WORK	60P	2
Total		5 courses	-	26
SEMESTER-V				
Course Code	Course Nature	Course Title	Course wise Class (L+T+P)	Credit
GEO/H/CC/T/11	Core	RESEARCH METHODOLOGY AND FIELD WORK	60T	4
GEO/H/CC/P/11			60P	2
GEO/H/CC/T/12	Core	REMOTE SENSING AND GIS	60T	4
GEO/H/CC/P/12			60P	2
GEO/H/DSE/T/01/A or GEO/H/DSE/T/01/B	DSE	URBAN GEOGRAPHY OR CULTURAL AND SETTLEMENT GEOGRAPHY	75L+15T	6x2=12
GEO/H/DSE/T/02/A or GEO/H/DSE/T/02/B	DSE	POPULATION GEOGRAPHY OR SOCIAL GEOGRAPHY	75L+15T	
Total		4 courses	-	24
SEMESTER-VI				
Course Code	Course Nature	Course Title	Course wise Class (L+T+P)	Credit
GEO/H/CC/T/13	Core	EVOLUTION OF GEOGRAPHICAL THOUGHTS	75L+15T	6
GEO/H/CC/T/14	Core	DISASTER MANAGEMENT	60T	4
GEO/H/CC/P/14			60P	2
GEO/H/DSE/T/03/A or GEO/H/DSE/T/03/B	DSE	FLUVIAL GEOMORPHOLOGY OR RESOURCE GEOGRAPHY	75L+15T	6x2=12
GEO/H/DSE/T/04/A or GEO/H/DSE/T/04/B	DSE	SOIL AND BIO GEOGRAPHY OR AGRICULTURAL GEOGRAPHY	75L+15T	
Total		4 courses	-	24
Total (All semesters)		26 courses	-	140

B.A./B.Sc. (Honours) in Geography:

CORE COURSE (CC):

GEO/H/CC/T/01: (Theory): Geotectonics and Geomorphology

6 Credits

Unit-1: Geotectonics

2 Credits

1. Earth's tectonic and structural evolution with reference to geological time scale
2. Earth's interior with special reference to seismology
3. Concept of Isostasy: Theories of Airy and Pratt
4. Earth movements: Plate tectonics; Types of folds and faults; Earthquakes and Volcanoes

Unit-2: Geomorphology

4 Credits

1. Geomorphology: Nature and Scope
2. Degradation processes: Weathering; Mass wasting and resultant landforms
3. Models of landscape evolution: Views of Davis, Penck, King and Hack
4. Development of river network and landforms on uniclinal and folded structures
5. Evolution of Landforms (Erosional and Depositional): Fluvial, Karst, Aeolian, Glacial and Coastal

Reference Books:

- Bloom, A. L., 2001: Geomorphology: A Systematic Analysis of Late Cenozoic Landforms, Prentice-Hall of India, New Delhi
- Bridges, E. M., 1990: World Geomorphology, Cambridge University Press, Cambridge
- Christopherson, R. W., 2011: Geosystems: An Introduction to Physical Geography, 8 Ed., Macmillan Publishing Company
- Kale, V. S., and Gupta, A., 2001: Introduction to Geomorphology, Orient Longman, Hyderabad
- Knighton, A. D., 1984: Fluvial Forms and Processes, Edward Arnold Publishers, London
- Selby, M. J., 2005: Earth's Changing Surface, Indian Edition, OUP
- Skinner, B. J., and Stephen, C. P., 2000: The Dynamic Earth: An Introduction to physical Geology, 4th Edition, John Wiley and Sons
- Thornbury, W. D., 1969: Principles of Geomorphology, Wiley
- Singh, S. 1998: Geomorphology, Prayag Pustak, Allahabad

CC/02: Cartographic Techniques and Geological Map Study

6 Credits

GEO/H/CC/T/02: (Theory): Cartographic Techniques and Geological Map Study

4 Credits

1. Cartography: Nature and Scope
2. Maps: Classification and Types; Components of a Map
3. Concept of Scales: Linear, Comparative, Diagonal and Vernier
4. Coordinate Systems: Polar and Rectangular; Concept of Geoid and Spheroid; Map Projections: Classification, Properties and Uses; Concept and Significance of UTM Projection
5. Survey of India Topographical Maps: Reference Scheme of Old and Open series
6. Types of Rocks and Minerals; Characteristics of Granite, Basalt, Dolerite, Pegmatite, Gneiss, Shale, Sandstone, Slate, Marble, Quartzite, Quartz, Feldspar, Mica, Limestone, Calcite, Bauxite, Magnetite, Hematite, Galena (using samples of rocks and minerals)
7. Concept of Bedding Plane, Unconformity and Non-conformity, Thickness of Bed, Dip, Throw, Hade, Heave

GEO/H/CC/P/02: (Practical): Cartographic Techniques and Geological Map Study

2 Credits

1. Construction of Scales: Linear, Comparative, Diagonal and Vernier
2. Construction of Projections: Polar Zenithal Stereographic Projection, Simple Conic with One Standard Parallel Projection, Bonne's Projection and Mercator's Projection
3. Construction and Interpretation of Relief Profiles (Superimposed, Projected and Composite), Preparation of Relative Relief Map, Average Slope Map (Wentworth Method), and Stream Ordering (After Strahler) on a Drainage Basin
4. Transect chart: Relation between physical and cultural features from topographical maps (Survey of India)
5. Geological Map (Problems related to Horizontal, Uniclinal, Folded and Faulted Structure); Drawing of Geological Section and Interpretation of the Map

*A Project File, comprising one exercise each is to be submitted.

Reference Books:

- Anson, R., and Ormelling, F. J., 1994: International Cartographic Association: Basic Cartographic Vol., Pregmen Press
- Gupta, K. K., and Tyagi, V. C., 1992: Working with Map, Survey of India, DST, New Delhi
- Mishra, R. P., and Ramesh, A., 1989: Fundamentals of Cartography, Concept, New Delhi
- Monkhouse, F. J., and Wilkinson H. R., 1973: Maps and Diagrams, Methuen, London
- Robinson, A. H., 2009: Elements of Cartography, John Wiley and Sons, New York
- Singh, R. L., and Singh, R. P. B., 1999: Elements of Practical Geography, Kalyani Publishers
- Sarkar, A. 2015: Practical Geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi

GEO/H/CC/T/03 : (Theory): Human Geography

6 Credits

Unit-1: Nature and Principles

2 Credits

1. Introduction: Defining Human Geography; Major Themes; Contemporary Relevance
2. Evolution of Humans; Concept of Race and Ethnicity; Major Racial Groups of the World
3. Space, Society and Cultural Regions (Language and Religion)
4. Concept: Culture, Cultural Diffusion, Community, Society, Cultural Realms

Unit-2: Society, Demography and Ekistics

4 Credits

1. Evolution of Human Society: Hunting and Gathering, Pastoral Nomadism, Subsistence Farming, Industrial and Urban Society
2. Population Growth and Distribution, Population Composition; Demographic Transition Model
3. Population–Resource Regions (Ackerman)
4. Population and Environment Relations with special reference to Development–Environment Conflict
5. Social Morphology and Rural House Types in India
6. Types and Patterns of Rural Settlements
7. Functional Classification of Urban Settlements
8. Trends and Pattern of World Urbanization

Reference Books:

- Bergman, E. F., 1995: Human Geography-Culture, Connections and Landscape, Prentice Hall, New Jersey
- Chisholm, 1975: Human Geography, Penguin Books, Hermondsworth
- Daniel, P. A., and Hopkinson, M. F., 1989: The Geography of Settlement, Oliver & Boyd, London
- Johnston, R., Gregory, D., Pratt, G. et al., 2008: The Dictionary of Human Geography, Blackwell Publication
- Jordan-Bychkov, et al., 2006: The Human Mosaic: A Thematic Introduction to Cultural Geography, W. H. Freeman and Company, New York
- Pearce, D., 1995: Tourism Today: A Geographical Analysis, 2nd edition, Longman Scientific & Technical, London
- Pickering, K., and Owen, A. A., 1997: An Introduction to Global Environmental Issues, 2nd edition, Rutledge, London
- Raw, M., 1986: Understanding Human Geography: A Practical Approach, Bell and Hyman. London
- Rubenstein, J. M., 2002: The Cultural Landscape, 7th edition, Prentice Hall, Englewood Cliffs
- Smith, D. M., 1982: Human Geography: A Welfare Approach, Edward Arnold, London
- Hussain, M., 2011: Human Geography, Rawat publication, Jaipur
- Chandna, R. C., 2016: Geography of Population- Concepts, Dterminants and Patterns, Kalyani publishers

CC/04: Cartograms, Survey and Thematic Mapping 6 Credits

GEO/H/CC/T/04: (Theory): Cartograms, Survey and Thematic Mapping 4 Credits

1. Concepts of Cartograms and Thematic Maps
2. Concept and Utility of Isopleth and Choropleth
3. Concept, utility and Interpretation of: Climograph, Hythergraph and Ergograph
4. Preparation and Interpretation of Demographic Charts and Diagrams (Age-Sex Pyramid)
5. Concepts of Bearing: Magnetic and True, Whole-circle and Reduced
6. Basic Concepts of Surveying and Survey Equipments: Abneys Level, Clinometer
7. Basic Concepts of Surveying and Survey Equipments: Prismatic Compass, Dumpy Level, Transit Theodolite
8. Interpretation of Landuse and landcover maps

GEO/H/CC/P/04: (Practical): Cartograms, Survey and Thematic Mapping 2 Credits

1. Diagrammatic Representation of Data: Star and Age-sex Pyramid Diagram, Pie Diagram
2. Representation of Data on Map by Proportional Circles, Dots and Spheres, Isolines and Choropleth method
3. Survey: Traversing by Prismatic Compass and Dumpy Level with One Change Point (Profile Drawing)
4. Determination of Height of Objects using Transit Theodolite (Accessible bases)

*A Project File, comprising one exercise each is to be submitted

Reference Books:

- Cuff, J. D., and Mattson, M. T., 1982: Thematic Maps: Their Design and Production, Methuen Young Books
- Dent, B. D., Torguson, J. S., and Holder, T. W., 2008: Cartography: Thematic Map Design (6th Edition), Mcgraw-Hill Higher Education
- Gupta, K. K., and Tyagi, V. C., 1992: Working with Maps, Survey of India, DST, New Delhi
- Kraak, M.-J., and Ormeling, F., 2003: Cartography: Visualization of Geo-Spatial Data, Prentice-Hall
- Mishra, R. P., and Ramesh, A., 1989: Fundamentals of Cartography, Concept, New Delhi
- Singh, R. L., and Singh, R. P. B., 1999: Elements of Practical Geography, Kalyani Publishers
- Slocum, T. A., McMaster, R. B., and Kessler F. C., 2008: Thematic Cartography and Geovisualization (3rd Edition), Prentice Hall
- Tyner, J. A., 2010: Principles of Map Design, The Guilford Press
- Sarkar, A., 2015: Practical Geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi

Unit-1: Elements of the Atmosphere

2 Credits

1. Nature, Composition and Layering of the Atmosphere
2. Insolation: Controlling Factors. Heat Budget of the Atmosphere
3. Temperature: Horizontal and Vertical Distribution; Inversion of Temperature: Types, Causes and Consequences
4. Greenhouse Effect and Importance of Ozone Layer

Unit-2: Atmospheric Phenomena, Climate Change and Climatic Classification

4 Credits

1. Condensation: Processes and Forms; Mechanism of Precipitation: Bergeron-Findeisen Theory, Collision and Coalescence; Forms of Precipitation
2. Air mass: Typology, Origin, Characteristics and Modification
3. Fronts: Warm and Cold; Frontogenesis and Frontolysis
4. Weather: Stability and Instability; Barotropic and Baroclinic Conditions
5. Circulation in the Atmosphere: Planetary Winds; Jet Stream
6. Monsoon Circulation and Mechanism with reference to India
7. Tropical and Mid-latitude Cyclones
8. Climatic Classification after Köppen, Thornthwaite (1931 and 1948)

Reference Books:

- Barry, R. G., and Carleton, A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK
- Barry, R. G., and Chorley, R. J., 1998: Atmosphere, Weather and Climate, Routledge, New York
- Critchfield, H. J., 1987: General Climatology, Prentice-Hall of India, New Delhi
- Lutgens, F. K., Tarbuck, E. J., and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey
- Oliver, J. E., and Hidore, J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi
- Trewartha, G. T., and Horne L. H., 1980: An Introduction to Climate, McGraw
- Lal, D. S., 1993: Climatology, 3rd edition, Chaitanya Pub. House, New Delhi
- Singh, S., 2013: Climatology, Prayag Pustak Bhawan, Allahabad

CC/06: Statistical Methods in Geography**6 Credits****GEO/H/CC/T/06: (Theory): Statistical Methods in Geography****4 Credits****Unit-1:**

1. Importance and Significance of Statistics in Geography; Discrete and Continuous Data; Population and Samples; Scales of Measurement (Nominal, Ordinal, Interval and Ratio); Sources of Data
2. Collection of Data and Formation of Statistical Tables
3. Sampling: Need, Types, and Significance and Methods of Purposive, Random
4. Distribution: Frequency, Cumulative Frequency; Probability: Normal, Systematic and Stratified Distribution

Unit-2:

1. Central Tendency: Mean, Median, Mode, Partition Values
2. Measures of Dispersion: Range, Mean Deviation, Standard Deviation, Coefficient of Variation
3. Association and Correlation: Rank Correlation, Product Moment Correlation
4. Linear Regression and Time Series Analysis

GEO/H/CC/P/06: (Practical): Statistical Methods in Geography**2 Credits**

1. Construction of Data Matrix with each Row representing an Aerial Unit (Districts / Blocks / Mouzas / Towns) and Corresponding Columns of Relevant Attributes
2. Based on the above, a Frequency Table, Measures of Central Tendency and Dispersion would be Computed and Interpreted
3. Histograms and Frequency Curve would be Prepared on the Dataset
4. Based on the Sample Set and using Two Relevant Attributes, a Scatter Diagram and Regression Line would be Plotted and Residual from Regression would be Mapped with a short Interpretation

*A Project File, comprising one exercise each is to be submitted

Reference Books:

- Berry, B. J. L., and Marble, D. F. (eds.): Spatial Analysis – A Reader in Geography
- Ebdon, D., 1977: Statistics in Geography: A Practical Approach
- Hammond, P., and McCullagh, P. S., 1978: Quantitative Techniques in Geography: An Introduction, Oxford University Press
- King, L. S., 1969: Statistical Analysis in Geography, Prentice-Hall
- Mahmood, A., 1977: Statistical Methods in Geographical Studies, Concept
- Pal, S. K., 1998: Statistics for Geoscientists, Tata McGraw Hill, New Delhi
- Silk, J., 1979: Statistical Concepts in Geography, Allen and Unwin, London
- Spiegel, M. R.: Statistics, Schaum's Outline Series
- Yeats, M., 1974: An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York
- Das, N. G., 2017: Statical Methods (combined volumes) Mc.Grew Hill Education

GEO/H/CC/T/07: (Theory): Geography of India**6 Credits****Unit-1: Geography of India****4 Credits**

1. Physical: Geology and Physiographic Divisions
2. Regionalisation of India: Physiographic (R.L. Sing); Socio-Cultural (Sopher) and Economic (Sengupta)
3. Climate, Soil and Vegetation: Characteristics and Classification
4. Population: Distribution, Growth, Structure and Policy
5. Distribution of Population by Race, Caste, Religion, Language, Tribes
6. Agricultural Regions; Green Revolution and its Consequences
7. Mineral and Power Resources: Distribution and Utilisation of Iron Ore, Coal, Petroleum, Natural Gas
8. Industrial Development: Automobile and Information Technology

Unit 2: Geography of West Bengal**2 Credits**

1. Physical Perspectives: Physiographic Divisions, Forest and Water Resources
2. Population: Growth, Distribution and Human Development
3. Resources: Mining, Agriculture and Industries
4. Regional Development: Darjeeling Hills, Sundarban Delta, Nadia and Murshidabad District

Reference Books:

- Deshpande, C. D., 1992: India: A Regional Interpretation, ICSSR, New Delhi
- Johnson, B. L. C., (ed.), 2001: Geographical Dictionary of India, Vision Books, New Delhi
- Mandal, R. B. (ed.), 1990: Patterns of Regional Geography – An International Perspective, Vol. 3 – Indian Perspective
- Galina, S., and Sengupta, P., 1967: Economic Regionalisation of India, Census of India
- Sharma, T. C., 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi
- Singh, R. L., 1971: India: A Regional Geography, National Geographical Society of India
- Singh, J., 2003: India - A Comprehensive & Systematic Geography, Gyanodaya Prakashan, Gorakhpur
- Spate, O. H. K., and Learmonth, A. T. A., 1967: India and Pakistan: A General and Regional Geography, Methuen
- Tirtha, R., 2002: Geography of India, Rawat Publs., Jaipur & New Delhi
- Pathak, C. R., 2003: Spatial Structure and Processes of Development in India. Regional Science Assoc., Kolkata
- Tiwari, R. C., 2007: Geography of India. Prayag Pustak Bhawan, Allahabad
- Sharma, T. C., 2013: Economic Geography of India. Rawat Publication, Jaipur
- Khullar, D. R., 2014: India: A Comprehensive Geography, Kalyani publishers
- Dutta, R., and Sundaram, K. P. M., 1999: Indian Economy. S. Chand and Company Limited, New Delhi
- Mamoria, C. B., 1996: Economic and Commercial Geography of India. Revised edition, Shivlal Aggarwala and Co., Agra

Generic Elective (GE):

[For Students other than Geography Honours]

GE/01: Disaster Management or Geography of Tourism **6 Credits**

GEO/H/GE/T/01/A: (Theory): Disaster Management **6Credits**

1. Definition and Concepts: Hazards, Disasters; Risk and Vulnerability; Classification of hazards
2. Disasters in India: (a) Flood: Causes, Impact, Distribution and Mapping; Landslide: Causes, Impact, Distribution and Mapping; Drought: Causes, Impact, Distribution and Mapping
3. Disasters in India: (b) Earthquake and Tsunami: Causes, Impact, Distribution and Mapping; Cyclone: Causes, Impact, Distribution and Mapping.
4. Manmade disasters: Causes, Impact, Distribution and Mapping of Soil erosion and Accidental release of toxic chemicals
5. Response and Mitigation to Disasters: Institutional set up, NDMA and NIDM; Indigenous Knowledge and Community-Based Disaster Management; Do's and Don'ts During and Post Disasters

Reference Books:

- Government of India., 1997: Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.
- Kapur, A., 2010: Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
- Modh, S., 2010: Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
- Singh, R.B., 2005: Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi. Chapter 1, 2 and 3
- Singh, R. B. (ed.), 2006: Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.
- Sinha, A., 2001: Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.
- Stoltman, J.P. et al., 2004: International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.
- Singh Jagbir., 2007: "Disaster Management Future Challenges and Oppurtunities", 2007. Publisher- I.K. International Pvt. Ltd. S-25, Green Park Extension, Uphaar Cinema Market, New Delhi, India (www.ikbooks.com).

OR

GEO/H/GE/T/01/B: (Theory): Geography of Tourism

6 Credits

1. Scope and Nature: Concepts and Issues, Tourism, Recreation and Leisure Inter-Relations; Geographical Parameters of Tourism by Robinson
2. Types of Tourism: Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage
3. Recent Trends of Tourism: International and Regional; Domestic (India); Eco-Tourism, Sustainable Tourism, Meetings, Incentives, Conventions and Exhibitions (MICE)
4. Impact of Tourism: Economy; Environment; Society
5. Tourism in India: Tourism Infrastructure; Case Studies of Himalaya, Desert and Coastal Areas; National Tourism Policy

Reference Books:

- Dhar, P.N., 2006: International Tourism: Emerging Challenges and Future Prospects. Kanishka, New Delhi.
- Hall, M. and Stephen, P., 2006: Geography of Tourism and Recreation – Environment, Place and Space, Routledge, London.
- Kamra, K. K. and Chand, M., 2007: Basics of Tourism: Theory, Operation and Practise, Kanishka Publishers, Pune.
- Page, S. J., 2011: Tourism Management: An Introduction, Butterworth-Heinemann-USA. Chapter 2.
- Raj, R. and Nigel, D., 2007: Morpeth Religious Tourism and Pilgrimage Festivals Management: An International perspective by, CABI, Cambridge, USA, www.cabi.org.
- Tourism Recreation and Research Journal, Center for Tourism Research and Development, Lucknow
- Singh Jagbir., 2014: “Eco-Tourism” Published by - I.K. International Pvt. Ltd. S-25, Green Park Extension, Uphaar Cinema Market, New Delhi, India (www.ikbooks.com).

GE/2: Geospatial Technology or Regional Development 6 Credits

GEO/H/GE/T/02/A: (Theory): Geospatial Technology 6 Credits

1. Definition, scope and historical development of geospatial technology
2. Concepts of spheroid, ellipsoid and projection systems. Significance of WGS 84 and UTM
3. Data types and structures in spatial technology
4. Classification of Remote Sensing platforms, sensors and resolution. IRS (Resourcesat and Cartosat) and Landsat systems
5. Concept and function of GPS, DGPS and Total Station
6. Functions of Spatial information system: Information retrieval; Topological modeling; Networks; Overlay; Data output
7. Visual and Digital techniques of image interpretation
8. Development of web-based spatial platforms with reference to Bhuvan and Google Earth
9. Application of Geospatial Technology

Reference Books:

- C. Esperança and H. Samet, An overview of the SAND spatial database system, to appear in Communications of the ACM, 1997. <http://www.cs.umd.edu/~hjs/pubs/sandprog.ps.gz>
- G. Hjaltason and H. Samet, Ranking in Spatial Databases in Advances in Spatial Databases —4th Symposium, SSD'95, M. J. Egenhofer and J. R. Herring, Eds., Lecture Notes in Computer Science 951, Springer-Verlag, Berlin, 1995, 83-95. <http://www.cs.umd.edu/~hjs/pubs/incnear.ps>
- H. Samet, Spatial Data Structures in Modern Database Systems: The Object Model, Interoperability, and Beyond, W. Kim, Ed., Addison-Wesley/ACM Press, 1995, 361-385. <http://www.cs.umd.edu/~hjs/pubs/kim.ps>
- H. Samet, Applications of Spatial Data Structures: Computer Graphics, Image Processing, and GIS, Addison-Wesley, Reading, MA, 1990. ISBN 0-201- 50300-0. 6. H. Samet, The Design and Analysis of Spatial Data Structures, Addison-Wesley, Reading, MA, 1990. ISBN 0-201-50255-0.
- H. Samet and W. G. Aref, Spatial Data Models and Query Processing in Modern Database Systems: The Object Model, Interoperability, and Beyond, W. Kim, Ed., Addison-Wesley/ACM Press, 1995, 338-360. <http://www.cs.umd.edu/~hjs/pubs/kim2.ps>
- C. D. Tomlin, Geographic Information Systems and Cartographic Modeling, Prentice-Hall, Englewood Cliffs, NJ, 1990. ISBN 0-13-350927-3.

OR

GEO/H/GE/T/02/B: (Theory): Regional Development

6 Credits

1. Definition of Region, Evolution, Types and Need of Regional planning: Formal, Functional and Planning Regions and Regional Development
2. Regional Imbalances and Problems of Functional Regions
3. Choice of a Region for Planning: Characteristics of an Ideal Planning Region; Delineation of Planning Region; Regionalization of India for Planning (Agro Ecological Zones)
4. Strategies/Models for Regional Planning: Growth Pole Model of Perroux; Growth Centre Model in Indian Context; Village Cluster
5. Problem Regions and Regional Planning: Backward Regions and Regional Plans- Special Area Development Plans in India; DVC-The Success Story and the Failures
6. Concept of Human Development and HDI (Human Development Index)

Reference Books:

- Adell, Germán., 1999: Literature Review: Theories and Models Of The Peri-Urban Interface: A Changing Conceptual Landscape, Peri-urban Research Project Team, Development Planning Unit, University College London at
- Bhatt, L.S., 1976: Micro Level Planning in India. KB Publication, Delhi
- Deshpande C. D., 1992: *India: A Regional Interpretation*, ICSSR, New Delhi.
- Dreze J. and A. Sen, Indian Development: Select Regional Perspectives (Oxford: Oxford University Press, 1996).
- Ses, Amratya., 2000: Development as Freedom. Random House, Toronto
- Raza, M., Ed., 1988:. Regional Development. Contributions to Indian Geography. New Delhi, Heritage Publishers.
- Rapley, John., 2007: Understanding Development: Theory and Practice in the 3rd World. Lynne Rienner, London.
- Schmidt-Kallert, Einhard., 2005: A Short Introduction to Micro-Regional Planning, Food and Agriculture Organization of the United Nations (FAO) at
- Sdyasuk Galina and P Sengupta., 1967: *Economic Regionalisation of India*, Census of India

GE/3: Climate Change: Vulnerability and Adaptation or Rural Development 6 Credits

GEO/H/GE/T/03/A: (Theory): Climate Change: Vulnerability and Adaptation

6 Credits

1. Science of Climate Change: Understanding Climate Change; Green House Gases and Global Warming; Global Climatic Assessment- IPCC Reports
2. Climate Change and Vulnerability: Physical Vulnerability; Economic Vulnerability; Social Vulnerability
3. Impact of Climate Change: Agriculture and Water; Flora and Fauna; Human Health
4. Adaptation and Mitigation: Global Initiatives with Particular Reference to South Asia
5. Key Concepts of National Action Plan of India on Climate Change; Role of Local Institutions (Urban Local Bodies, Panchayats) on Climatic Change Mitigation: Awareness and Action Programmes

Reference Books:

- IPCC. 2007: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.*
- IPCC. 2014: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- IPCC. 2014: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Palutikof, J. P., van der Linden, P. J. and Hanson, C. E. (eds.), Cambridge University Press, Cambridge, UK.
- OECD. 2008: *Climate Change Mitigation: What Do we Do? Organisation and Economic Cooperation and Development.*
- UNEP. 2007: *Global Environment Outlook: GEO4: Environment for Development, United Nations Environment Programme.*
- Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) 2014: *Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1. Advances in Geographical and Environmental Studies, Springer*
- Sen Roy, S. and Singh, R.B., 2002: *Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions, Oxford & IBH Pub., New Delhi.*

OR

GEO/H/GE/T/03/B: (Theory): Rural Development

6 Credits

1. Defining Development: Inter-Dependence of Urban and Rural Sectors of the Economy; Need for Rural Development, Gandhian Approach of Rural Development
2. Rural Economic Base: Panchayatiraj System, Agriculture and Allied Sectors, Seasonality and Need for Expanding Non-Farm Activities, Co-operatives, PURA
3. Area Based Approach to Rural Development: Drought Prone Area Programmes, PMGSY
4. Target Group Approach to Rural Development: SJSY, MNREGA, Jan Dhan Yojana and Rural Connectivity
5. Provision of Services – Physical and Socio-Economic Access to Elementary Education and Primary Health Care and Micro credit

Reference Books:

- 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.
- Misra, R. P. (ed.), 1985: *Rural Development: Capitalist and Socialist Paths*, Vol. 1, Concept, New Delhi.
- Palione M., 1984: *Rural Geography*, Harper and Row, London.
- Ramachandran H. and Guimaraes J.P.C., 1991: *Integrated Rural Development in Asia – Learning from Recent Experience*, Concept Publishing, New Delhi.
- 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.

SKILL ENHANCEMENT COURSE (SEC):

GEO/H/SEC/P/01/A: (Practical): Computer Basics and Computer Applications

2 Credits

1. Numbering Systems; Binary Arithmetic
2. Data Computation, Storing and Formatting in Spreadsheets: Computation of Rank, Mean, Median, Mode, Standard Deviation, Moving Averages, Derivation of Correlation, Coefficient of Variation , Regression
3. Preparation of Annotated Diagrams and its Interpretation: Scatter Diagram and Histogram
4. Internet Surfing: Generation and Extraction of Information

Reference Books:

- Bartee, T. C., 1977: Digital Computer Fundamental; McGraw Hill
- Chauhan, S., Chauhan, A., and Gupta, K., 2006: Fundamental of Computer; Firewall Media
- Flake, L. J., McClintock, C. E., and Turner, S., 1989: Fundamental of Computer Education; Wordsworth Pub. Co
- Leon, A., and Leon, M., 1999: Introduction to Computer, USB Publishers' Distributors Ltd
- Malvino, A. P., Leach, D. P., 1981: Digital Principles and Applications; Tata McGraw Hill
- Mano, M. M., and Kime, C. R., 2004: Logic and Computer Design Fundamental; Prentice Hall
- Rajaraman, V., 2003: Fundamentals of Computer, Prentice Hall Publisher
- Sarkar, A., and Gupta, S. K., 2002: Elements of computer Science, S Chand and Company, New Delhi
- Blissmer, 1996: Working with MS Word; Houghton Mifflin Co
- Johnson, S., 2007: Microsoft Power Point 2007; Pearson Paravia Bruno
- Leon, A., and Leon, M., 1999: Introduction to Computer, USB Publishers' Distributors Ltd
- Leon, A., and Leon, M., 1999: A Beginners Guide to Computers, Vikas
- Rajaraman, V., 2008: Computer Primer; Prentice Hall of India Pvt. Ltd
- Sarkar, A., and Gupta, S. K., 2002: Elements of Computer Science, S Chand and Company, New Delhi
- Shepard, A., 2007: Perfect Pages; Shepard Publications
- Tyson, H. L., 2007: Microsoft Word 2007 Bible; John Wiley
- Walkenbach, J., 2007: Excel 2007 Bible; John Wiley

OR

GEO/H/SEC/P/01/B: (Practical): Remote Sensing

2 Credits

1. Concepts and Principles of Remote Sensing (RS): Classification of RS Satellites and Sensors
2. Sensor Resolutions and Their Application with reference to IRS and Landsat Missions, Image Referencing Schemes and Data Acquisition
3. Preparation of False Colour Composites (FCC) from IRS LISS-III and Landsat TM, Landsat ETM; Principles of Image Rectification and Enhancement
4. Principles of Image Interpretation and Feature Extraction, Preparation of Inventories of Landuse/ landcover Features from Satellite Images

*A Project File Consisting of Four Exercises on the Above Themes is to be submitted

Reference Books:

- Bhatta, B., 2008: Remote Sensing and GIS, Oxford University Press, New Delhi
- Campbell, J. B., 2007: Introduction to Remote Sensing, Guildford Press
- Jensen, J. R., 2005: Introductory Digital Image Processing: A Remote Sensing Perspective, Pearson Prentice-Hall
- Joseph, G., 2005: Fundamentals of Remote Sensing, United Press India
- Lillesand, T. M., Kiefer, R. W., and Chipman, J. W., 2004: Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition)
- Li, Z., Chen, J., and Batsavias, E., 2008: Advances in Photogrammetry, Remote Sensing and Spatial Information Sciences CRC Press, Taylor and Francis, London
- Mukherjee, S., 2004: Textbook of Environmental Remote Sensing, Macmillan, Delhi
- Nag, P., and Kudra, M., 1998: Digital Remote Sensing, Concept, New Delhi
- Singh, R. B., and Murai, S., 1998: Space-informatics for Sustainable Development, Oxford and IBH Pub