CBCS Syllabus of Geography Honours

SKBU, Purulia

SEMESTER-I

CC 1 – Geotectonics and Geomorphology

Unit 1: Geotectonics

1. Earth's tectonic and structural evolution with reference to geological time scale
2. Earth's interior with special reference to seismology. Isostasy: Models of Airy and Pratt
3. Plate Tectonics: Processes at constructive, conservative, destructive margins and hotspots; resulting landforms
4. Folds and Faults—origin and types

Unit 2: Geomorphology

5. Degradational processes: Weathering, mass wasting and resultant landforms
6. Processes of entrainment, transportation and deposition by different geomorphic agents. Role of humans in landform development.
7. Development of river network and landforms on uniclinal and folded structures
8. Landforms on igneous rocks with special reference to Granite and Basalt
9. Karst landforms: Surface and sub-surface
10. Glacial and fluvio-glacial processes and landforms; fluvio-glacial landforms
11. Aeolian and fluvio-aeolian processes and landforms; fluvio-aeolian processes
12. Models on landscape evolution: Views of Davis, Penck, King and Hack

Reading References:

- 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, Robert W., (2011), Geosystems: An Introduction to Physical Geography, 8th 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, Brinan J. and Stephen C. Porter (2000), The Dynamic Earth: An Introduction to physical Geology, 4th Edition, John Wiley and Sons
- Thornbury W. D., 1969: Principles of Geomorphology, Wiley.

CC 2 – Cartographic Techniques

Concepts in Theory

1. Maps: Classification and types. Components of a map.
2. Concept and application of scales: Plain, comparative, diagonal and vernier
3. Coordinate systems: Polar and rectangular. Concept of geoid and spheroid
4. Concept of generating globe. Grids: angular and linear systems of measurement
5. Bearing: Magnetic and true, whole-circle and reduced.
6. Map projections: Classification, properties and uses. Concept and significance of UTM projection.
7. Basic concepts of surveying and survey equipment: Prismatic compass, dumpy level, theodolite, Abney level, clinometer.
8. Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps

List of Practical

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

9. Graphical construction of scales: Plain, comparative, diagonal and vernier
10. Construction of projections:Polar Zenithal Stereographic, Simple conic with two standard parallels, Bonne's, Cylindrical Equal Area, and Mercator's.
11. Delineation of drainage basin from Survey of India topographical map. Construction and interpretation of relief profiles (superimposed, projected and composite), relative relief map, slope map (Wentworth), and stream ordering (Strahler) on a drainage basin.
12. Correlation between physical and cultural features from Survey of India topographical maps. using transect chart.

Reading References:

- 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.
- Rhind D. W. and Taylor D. R. F., (eds.), 1989: Cartography: Past, Present and Future, Elsevier, International Cartographic Association.
- 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

SEMESTER-II

CC 3 – Hydrology and Oceanography

Unit 1: Hydrology

1. Systems approach in hydrology. Global hydrological cycle: Its physical and biological role
2. Run off: controlling factors. Infiltration and evapotranspiration. Run off cycle
3. Drainage basin as a hydrological unit. Principles of water harvesting and watershed management
4. Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement.

Unit 2: Oceanography

5. Major relief features of the ocean floor: characteristics and origin according to plate tectonics.
6. Physical and chemical properties of ocean water
7. Water mass, T–S diagram
8. Air-Sea interactions, ocean circulation, wave and tide.
9. Ocean temperature and salinity: Distribution and determinants.
10. Coral reefs: Formation, classification and threats.
11. Marine resources: Classification and sustainable utilisation
12. Sea level change: Types and causes

Reading References:

- Andrew. D. Ward and Stanley, Trimble (2004): Environmental Hydrology, 2nd edition, Lewis Publishers, CRC Press.
- Karanth, K.R., 1988: Ground Water: Exploration, Assessment and Development, Tata- McGraw Hill, New Delhi.
- Ramaswamy, C. (1985): Review of floods in India during the past 75 years: A Perspective. Indian National Science Academy, New Delhi.
- Rao, K.L., 1982: India's Water Wealth 2nd edition, Orient Longman, Delhi,
- Singh, Vijay P. (1995): Environmental Hydrology. Kluwer Academic Publications, the Netherlands.
- Anikouchine W. A. and Sternberg R. W., 1973: The World Oceans: An Introduction to Oceanography, Prentice-Hall.
- Garrison T., 1998: Oceanography, Wordsworth Company, Belmont.
- Kershaw S., 2000: Oceanography: An Earth Science Perspective, Stanley Thornes, And UK.
- Pinet P. R., 2008: Invitation to Oceanography (Fifth Edition), Jones and Barlett Publishers, USA, UK and Canada.
- Sverdrup K. A. and Armrest, E. V., 2008: An Introduction to the World Ocean, McGraw Hill, Boston.

Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Landscape ecology and water management.Proceedings of IGU Rohtak Conference, Volume 2.Advances in Geographical and Environmental Studies, Springer.

CC 4 – Cartograms and Thematic Mapping

Concepts in Theory

1. **Concepts of rounding, scientific notation, logarithm and anti-logarithm, natural and log scales**
2. Diagrammatic representation of data: Line, Bar, and Circle
3. Representation of point data: Isopleths.
4. Representation of area data: Dots, proportional circles and choropleth
5. Preparation and interpretation of large scale thematic maps: Geomorphological maps from Toposheet
6. Preparation and interpretation of large scale thematic maps: Climatological maps – Synoptic Chart
7. **Preparation and interpretation of large scale thematic maps: Landuselandcover maps – Based on Local Cadastral Map of Village / any Ward map of Munipality**
8. **Preparation and interpretation of large scale thematic maps: Socio-economic maps using Z-score and LQ techniques**.

List of Practical

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

Survey using Prismatic Compass and Dumpy Level

9. Thematic maps: Proportional squares, pie diagrams with proportional circles, dots and spheres
10. Thematic maps: Choropleth, isoline map, Chorochromatic map.
11. Geomorphological maps, Synoptic Chart, **Landuse landcover maps and Socio-economic maps.**

Reading References:

- 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. andOrmeling 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.

SEMESTER-III

CC 5 – Climatology

Unit 1: Elements of the Atmosphere

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 and Climatic Classification

1. Condensation: Process 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, index cycle
6. Tropical and mid-latitude cyclones
7. Monsoon circulation and mechanism with reference to India
8. Climatic classification after Köppen, Thornthwaite and Oliver

Reading References:

- Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
- Barry R. G. and Corley 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-Hill

CC 6 – Geography of India

Unit 1: Geography of India

1. Tectonic and stratigraphic provinces, physiographic divisions
2. Climate, soil and vegetation: Characteristics and classification
3. Population: Distribution, growth, structure and policy
4. Distribution of population by race, caste, religion, language, tribes and their correlates
5. Agricultural regions. Green revolution and its consequences
6. Mineral and power resources distribution and utilisation of iron ore, coal, petroleum, gas;
7. Industrial development: Automobile and information technology
8. Regionalisation of India: Physiographic (R. L. Singh), Socio-cultural (Sopher) and Economic (Sengupta)

Unit 2: Geography of West Bengal

1. Physical perspectives: Physiographic divisions, forest and water resources
2. Population: Growth, distribution and human development
3. Resources: Mining, agriculture and industries
4. Regional Problem: Darjeeling Hills, Jangalmahal and Sundarban

Reading References:

- 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 Intenational Perspective. Vol. 3 – Indian Perspective.
- Sdyasuk Galina and P Sengupta (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, Jagdish 2003: India - A Comprehensive & Systematic Geography, GyanodayaPrakashan, Gorakhpur.
- Spate O. H. K. and Learmonth A. T. A., 1967: India and Pakistan: A General and Regional Geography, Methuen.
- Tirtha, Ranjit 2002: Geography of India, RawatPubls., 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. PrayagPustakBhawan, Allahabad
- Sharma, T.C. (2013) Economic Geography of India. Rawat Publication, Jaipur

CC 7 – Statistical Methods in Geography

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 random sampling
4. Theoretical distribution: frequency, cumulative frequency, normal and probability

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. Regression (linear and non-linear) and time series analysis (moving average)

List of Practical

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

5. Construction of data matrix with each row representing an aerial unit (districts / blocks / mouzas / towns) and corresponding columns of relevant attributes.
6. Based on the above, a frequency table, measures of central tendency and dispersion would be computed and interpreted.
7. Histograms and frequency curve would be prepared on the dataset.
8. From the data matrix a sample set (20%) would be drawn using simple random method of sampling and locate the samples on a map with a short note on the method used.
9. Based on of 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.

Reading References:

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.

Sarkar, A. (2013) Quantitative geography: techniques and presentations. Orient Black Swan Private Ltd., 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

SE 1 – Disaster Management

1. Hazards and disasters: Concept
2. Classification of Hazard and Disaster
3. Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms
4. Responses to hazards: Preparedness, trauma and aftermath. Resilience and capacity building

Reading References:

- 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.

GE 1 – Climate Change: Vulnerability and Adaptation

Syllabus:

Unit 1: Elements of the Atmosphere

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 and Climatic Classification

1. Condensation: Process and forms. Mechanism of precipitation: Bergeron-Findeisen theory, collision and coalescence. Forms of precipitation.
2. Air mass: Typology, origin, characteristics and modification.
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5. Circulation in the atmosphere: Planetary winds, jet stream, index cycle
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Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
Barry R. G. and Corley 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

SEMESTER-IV

CC 8 – Regional Planning and Development

Unit 1: Regional Planning

1. Concept of regions: Types of regions and their delineation.
2. Types of planning, principles and objectives of regional planning, multi- level planning in India
3. Tools and techniques of regional planning, need for regional planning in India
4. Metropolitan concept: metropolitan areas, and urban agglomerations

Unit 2: Regional Development (~~Geography of West Bengal)~~

1. Development: Meaning, growth versus development
2. **Concept and strategies of regional development with reference to India**
3. **Theories and models for regional development : Growth pole model of perroux; growth centre model in Indian context**
4. **Theories and models for regional development: Cumulative causation (Myrdal) and core periphery (Hirschman, Rostov and Friedman)**
5. Changing concept of development, concept of underdevelopment; efficiency-equity debate
6. Indicators of development: Economic, social and environmental. Human development.
7. **Regional development in India, regional inequality, disparity and diversity**
8. Need and measures for balanced development in India

Reading References:

- Berry, BJ.L. and Horton, F.F. (1970): Geographic Perspectives on Urban Systems. Prentice Hall, New Jersey.
- Bhat L.S. (1972): Regional Planning In India, Statistical Publishing Society
- Blij H. J. De, 1971: Geography: Regions and Concepts, John Wiley and Sons.
- Chand ,M and Puri V.K. (1983) : Regional planning In India , allied publishers , New Delhi
- ClavalP.l, 1998: An Introduction to Regional Geography, Blackwell Publishers, Oxford and Massachusetts.
- Friedmann J. and Alonso W. (1975): Regional Policy - Readings in Theory and Applications, MIT Press, Massachusetts.
- Gore C. G., Köhler G., Reich U-P. andZiesemer T., 1996: Questioning Development; Essays on the Theory, Policies and Practice of Development Intervention, Metropolis-Verlag, Marburg.
- Hall, P. (1992): Urban and Regional Planning, Routledge, London.
- Haynes J., 2008: Development Studies, Polity Short Introduction Series.
- Johnson E. A. J., 1970: The Organization of Space in Developing Countries, MIT Press, Massachusetts.
- Kulshetra ,S.K,(2012) : Urban and Regional Planning in India : A hand book for Professional Practioners , Sage Publication , New Delhi

- Kundu, A. (1992): Urban Development Urban Research in India, Khanna Publ. New Delhi.
- Misra , R.P, Sundaram K.V, PrakashRao , VLS(1974): Regional Development Planning in India , Vikas Publication , New Delhi
- Misra, R.P (1992): Regional Planning: Concepts , techniques , Policies and Case Studies , Concept New Delhi
- Peet R., 1999: Theories of Development, The Guilford Press, New York.
- UNDP 2001-04: Human Development Report, Oxford University Press.
- World Bank 2001-05: World Development Report, Oxford University Press, New Delhi

CC 9 – Economic Geography

Unit 1: Introduction

1. Meaning and approaches to Economic Geography, new Economic Geography
2. Concepts in Economic Geography: Goods and services, production, exchange and consumption
3. Concept of economic man
4. Economic distance and transport costs

Unit 2: Economic Activities

1. Concept and classification of economic activities
2. Factors affecting location of economic activity with special reference to agriculture (Von Thunen), and industry (Weber).
3. Primary activities: Subsistence and commercial agriculture, forestry, fishing and mining
4. Secondary activities: Manufacturing (cotton textile, iron and steel), concept of manufacturing regions, special economic zones and technology parks
5. Tertiary activities: transport, trade and services
6. Agricultural systems: Case studies of tea plantation in India and mixed farming in Europe
7. Transnational sea-routes, railways and highways with reference to India
8. International agreements and trade blocs: GATT and OPEC

Reading References:

- Alexander J. W., 1963: Economic Geography, Prentice-Hall Inc., Englewood Cliffs, New Jersey.
- Coe N. M., Kelly P. F. and Yeung H. W., 2007: Economic Geography: A Contemporary Introduction, Wiley-Blackwell.
- Hodder B. W. and Lee Roger, 1974: Economic Geography, Taylor and Francis.
- Combes P., Mayer T. and Thisse J. F., 2008: Economic Geography: The Integration of Regions and Nations, Princeton University Press.
- Wheeler J. O., 1998: Economic Geography, Wiley.
- Durand L., 1961: Economic Geography, Crowell.
- Bagchi-Sen S. and Smith H. L., 2006: Economic Geography: Past, Present and Future, Taylor and Francis.
- Willington D. E., 2008: Economic Geography, Husband Press.
- Clark, Gordon L.; Feldman, M.P. and Gertler, M.S., eds. 2000: The Oxford

CC 10 – Remote Sensing

Concepts in Theory

1. Principles of Remote Sensing (RS): Classification of RS satellites and sensors
2. Sensor resolutions and their applications with reference to IRS and Landsat missions, image referencing schemes and data acquisition.
3. Preparation of False Colour Composites from IRS LISS-3 and Landsat TM and OLI data. Principles of image rectification and enhancement.
4. Principles of image interpretation and feature extraction. Preparation of inventories of landuse land cover (LULC) features from satellite images.

List of Practical

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

1. Georeferencing of maps and images
2. Image enhancement. Preparation of reflectance libraries of LULC features across different image bands of IRS L3 or Landsat OLI data
3. Image classification, post-classification analysis and class editing
4. Application of Remotely Sensed data on River Course, Forestry and Urban Growth Mapping

Reading References:

- Campbell J. B., 2007: Introduction to Remote Sensing, Guildford Press.
- Jensen J. R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective, 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).
- Nag P. and Kudra, M., 1998: Digital Remote Sensing, Concept, New Delhi.
- Rees W. G., 2001: Physical Principles of Remote Sensing, Cambridge University Press.
- Singh R. B. and Murai S., 1998: Space-informatics for Sustainable Development, Oxford and IBH Pub.
- Wolf P. R. and Dewitt B. A., 2000: Elements of Photogrammetry: With Applications in GIS, McGraw- Hill.
- Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi

SE 2- Advanced Spatial Statistical Techniques

Concepts in Theory

1. Probability theory, probability density functions with respect to Normal, Binomial and Poisson distributions and their geographical applications.
2. Sampling: Sampling plans for spatial and non-spatial data, sampling distributions. Sampling estimates for large and small samples tests involving means and proportions.
3. Correlation and Regression Analysis: Rank order correlation and product moment correlation; linear regression, residuals from regression, and simple curvilinear regression. Introduction to multi-variate analysis.
4. Time Series Analysis: Time Series processes; Smoothing time series; Time series components.

Any statistical Software Package (e.g., SPSS, MS Excel, R, etc.) may be used for practice. A project file consisting of four exercises on the above themes is to be submitted.

Reading References:

- Bart James E and GerldM.Barber, 1996: Elementary Statistics for Geographers, TheGuieford Press, London.

- Eldon, D., 1983: Statistics in Geography: A Practical Approach, Blackwell, London.
- Cressie, N.A.C., 1991: Statistics for Spatial Analysis, Wiley, New York.
- Gregory, S., 1978: Statistical Methods and the Geographer (4th Edition), Longman, London.
- Haining, R.P., 1990: Spatial Data Analysis in the Social and Environmental Science, Cambridge University Press, Cambridge.
- Mc Grew, Jr. and Cahrles, B. M., 1993: An Introduction to Statistical Problem Solving in Geography,
- W.C. Brocan Publishers, New Jersey.
- Mathews, J.A., 1987: Quantitative and Statistical Approaches to Geography: A Practical Manual Pergamon, Oxford.
- S.K., 1998: Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi.
- Wei, W.S., 1990: Time Series Analysis: Variate and Multivariate Methods, Addison Wesley Publishing.
- Yeates, Mauris, 1974: An Introduction to Quantitative Analysis in Human Geography, McGrawhill, New York

GE 2 – Rural Development

Concepts in Theory

1. Defining Development: Inter-Dependence of Urban and Rural Sectors of the Economy
2. Paradigms of Rural Development: Lewis Model of Economic Development, 'Big Push' theory of Development, Myrdal's thesis of 'Spread and Backwash Effects'
3. Need for Rural Development, Gandhian Approach to Rural Development
4. Rural Economic Base: Agriculture and Allied Sectors, Seasonality and Need for expanding Non-Farm Activities,
5. Rural Co-operatives and agricultural marketing
6. Area Based Approach to Rural Development: Drought Prone Area Programmes, PMGSY
7. Target Group Approach to Rural Development: SJSY, MNREGA, Jan DhanYojana
8. Provision of Services – Physical and Socio-Economic Access to Elementary Education and Primary Health Care and Micro credit; Concept of PURA
9. Rural Governance: Panchayati Raj System, Rural Development Policies and Programmes in India
10. Rural Infrastructural Development programmes relating to: Rural Electrification,
11. Transport, Housing, and Connectivity
12. Rural Development Programmes for Women and children: JananiSurakshaYojana , National Nutrition Mission, Drinking water and sanitation programmes, NRHM, SarvaSikha Mission

Reading References:

- Gilg A. W., 1985: An Introduction to Rural Geography, Edwin Arnold, London.

- Krishnamurthy, J. 2000: Rural Development - Problems and Prospects, RawatPubls., 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 – Leaning 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.

SEMESTER-V

CC 11 – Environmental Geography

Unit 1: Environmental Issues in Geography

1. Geographers' approach to environmental studies
2. Perception of environment in different stages of civilization
3. Concept of holistic environment and system approach
4. Ecosystem: Concept, structure and functions
5. Environmental pollution and degradation: Land, water and air
6. Space–time hierarchy of environmental problems: Local, regional and global
7. Urban environmental issues with special reference to waste management
8. Environmental programmes and policies – Global, national and local levels

Reading References:

- Chandna R. C., 2002: Environmental Geography, Kalyani, Ludhiana.
- Cunninghum W. P. and Cunninghum M. A., 2004: Principals of EnvironmentalScience: Inquiry and Applications, Tata Macgraw Hill, New Delhi.
- Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
- Singh, R.B. (Eds.) (2009) Biogeography and Biodiversity. Rawat Publication, Jaipur
- Miller G. T., 2004: Environmental Science: Working with the Earth, Thomson Brooks Cole, Singapore.
- MoEF, 2006: National Environmental Policy-2006, Ministry of Environment andForests, Government of India.
- Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India. Advances in Geographical and Environmental Studies, Springer
- Odum, E. P. et al, 2005: Fundamentals of Ecology, Ceneage Learning India.
- Singh S., 1997: Environmental Geography, PrayagPustakBhawan. Allahabad.
- 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

CC 12 – Research Methodology and Field Work

Unit 1: Research Methodology

1. Research in Geography: Meaning, types and significance
2. Literature review and formulation of research design
3. Defining research problem, objectives and hypothesis. Research materials and methods
4. Techniques of writing scientific reports: Preparing notes, references, bibliography, abstract and keywords

Unit 2: Field Work

1. Fieldwork in Geographical studies – Role and significance. Selection of study area and objectives. Pre-field preparations. Ethics of fieldwork
2. Field techniques and tools: Observation (participant, non participant), questionnaires (open, closed, structured, non-structured). Interview with special reverence to focused group discussions.
3. Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording.
4. Positioning and collection of samples. Preparation of inventory from field data. Post-field tasks.

List of Practical

5. Each student will prepare an individual report based on primary data collected form field survey and secondary data collected from different sources for either a rural area (mouza) or an urban area (municipal ward) based on cadastral or municipal maps to study specific problems.
6. The duration of the field work shall not exceed 10 days
7. The report should be hand written in English on A4 size paper in candidate's own words within 5,000 to 8,000 words excluding figures , tables , photographs , maps , references and appendices
8. A copy of the bound report, duly signed by the concerned teacher, should be submitted.

Reading References:

- Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi
- Robinson A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.

- Special Issue on “Doing Fieldwork” The Geographical Review 91:1-2 (2001).
- Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
- Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA

DSE 1 – Fluvial Geomorphology

Concepts in Theory

1. Scope and components of Fluvial Geomorphology. Rivers as hydro systems. Geographers approach to study of the rivers
2. Run off: components and controlling factors. Run off cycle
3. Models of channel initiation and network development
4. Drainage basin and its significance as a hydrological unit
5. Linear, areal and altitudinal properties of drainage basin. Horton's stream laws. Hypsometric curve and integer.
6. Fundamentals of Rosgen stream classification system
7. Fluvial morphodynamics: Adjustment of channel forms to tectonic, climatic, sea level and land use changes
8. Large rivers of the tropics: Characteristics and significance
9. Fluvial landforms: Terraces, alluvial fans, badlands and accretion topography
10. Human intervention on fluvial systems : Types and consequences
11. Riverbank erosion and river degeneration: Processes, management and impact on land use
12. Integrated watershed management: Principles and significance

Reading References:

- Bloom, A. L. 1998: Geomorphology: A Systematic Analysis of Late Cenozoic Landforms, 3rd Ed, Prentice Hall, Upper Saddle River, New Jersey
- Bridges, E. M., 1990: World Geomorphology, Cambridge University Press, Cambridge.
- Charlton, R. 2016: Fundamentals of Fluvial Geomorphology, 2nd Ed., Routledge, London
- Chorley, R., Schumm, S. and Sugden, D.E. 1994: Geomorphology, Methuen, London
- Chorley, R.J. and Kennedy, B.A. 1971: Physical Geography: A Systems Approach, Prentice Hall, Upper Saddle River, New Jersey
- Faniran, A. and Jeje, L.K. 1983: Humid Tropical Geomorphology, Longman, London
- Goudie, A.S. (ed) 2004: Encyclopaedia of Geomorphology, vol. 1 & 2, Routledge, London
- Gupta, A. 2011: Tropical Geomorphology, Cambridge University Press, Cambridge
- Gupta, A. (ed) 2008: Large Rivers, Wiley, New York
- Huggett, R.J. 2011: Fundamentals of Geomorphology, Routledge, New York
- Kale V.S. and Gupta A. 2001. Introduction to Geomorphology, Orient Longman, Hyderabad
- Knighton, D. 1998: Fluvial Forms and Processes: A New Perspective, Arnold, London
- Morisawa, M. 1985: Rivers, Longman, London
- Petts, G.E. and Amoros, C (eds). 1996: Fluvial Hydrosystems, Chapman and Hall, London
- Selby, M.J. 1985: Earth's Changing Surface, Oxford University Press, London

DSE 2- Urban Geography

Unit 1:

1. Urban Geography: nature and scope, different approaches and recent trends in urban geography
2. Origin of urban places in Ancient, Medieval, Modern and Post-Modern periods-factors, stages, and characteristics.
3. Theories of Urban Evolution and Growth: Hydraulic Theory, Economic Theory
4. Aspects of urban places: Location, site and situation, Size and Spacing of Cities: The Rank Size Rule, The Law of the Primate City
5. Urban Hierarchies : Central Place Theory; August Loch's theory of Market Centres
6. Patterns of urbanisation in developed and developing countries

Unit 2:

1. Ecological processes of urban growth; Urban fringe; City- Region
2. Theories of city structure-concentric zone theory, sector theory, multiple nuclei theory
3. Urban Issues: problems of housing, slums, civic amenities (water and transport)
4. Patterns and trends of urbanization in India
5. Policies on urbanization. Urban change/landscape in post-liberalized period in India
6. Case studies of Delhi, Kolkata, and Chandigarh with reference to land use

Reading References:

- Fyfe N. R. and Kenny J. T., 2005: The Urban Geography Reader, Routledge.
- Graham S. and Marvin S., 2001: Splintering Urbanism: Networked Infrastructures, Technological Mobility and the Urban Condition, Routledge.
- Hall T., 2006: Urban Geography, Taylor and Francis.
- Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: Urban Geography, John Wiley.
- Knox P. L. and McCarthy L., 2005: Urbanization: An Introduction to Urban Geography, Pearson Prentice Hall New York.
- Knox P. L. and Pinch S., 2006: Urban Social Geography: An Introduction, Prentice-Hall.
- Pacione M., 2009: Urban Geography: A Global Perspective, Taylor and Francis.
- Sassen S., 2001: The Global City: New York, London and Tokyo, Princeton University Press.
- Ramachandran R (1989): Urbanisation and Urban Systems of India, Oxford University Press, New Delhi
- Ramachandran, R., 1992: The Study of Urbanisation, Oxford University Press, Delhi
- Singh, R.B. (Eds.) (2001) Urban Sustainability in the Context of Global Change, Science Pub., Inc., Enfield (NH), USA and Oxford & IBH Pub., New Delhi.
- Singh, R.B. (Ed.) (2015) Urban development, challenges, risks and resilience in Asian megacities. Advances in Geographical and Environmental Studies, Springer

DSE 3- Population Geography

Unit 1:

1. Development of Population Geography as a field of specialization. Relation between population geography and demography. Sources of population data, their level of reliability and problems of mapping.
2. Population distribution: density and growth. Classical and modern theories in population distribution and growth, Demographic transition model.
3. World patterns determinants of population distribution and growth. Concept of optimum population.
4. Population distribution, density and growth profile in India.

Unit 2:

1. Population Composition and Characteristics– Age-Sex Composition; Rural and Urban Composition; Literacy.
2. Measurements of fertility and mortality. Concept of cohort and life table
3. Population composition of India. Urbanisation, Occupational structure.
4. Migration: Causes and types
5. National and international patterns of migration with reference to India.
6. Population and development: population-resource regions. Concept of human development index and its components.
7. Population policies in developed and less development countries. India's population policies, population and environment, implication for the future.
8. Contemporary Issues – Ageing of Population; Declining Sex Ratio; Population and environment dichotomy, HIV/AIDS.

Reading References:

- Barrett H. R., 1995: Population Geography, Oliver and Boyd.
- Bhende A. and Kanitkar T., 2000: Principles of Population Studies, Himalaya Publishing House.
- Chandna R. C. and Sidhu M. S., 1980: An Introduction to Population Geography, Kalyani Publishers.
- Clarke J. I., 1965: Population Geography, Pergamon Press, Oxford.
- Jones, H. R., 2000: -Population Geography, 3rd ed. Paul Chapman, London.
- Lutz W., Warren C. S. and Scherbov S., 2004: The End of the World Population Growth in the 21st Century, Earthscan
- Newbold K. B., 2009: Population Geography: Tools and Issues, Rowman and Littlefield Publishers.
- Pacione M., 1986: Population Geography: Progress and Prospect, Taylor and Francis.
- Wilson M. G. A., 1968: Population Geography, Nelson.

SEMESTER-VI

CC 13 – Evolution of Geographical Thought

Unit 1: Nature of Pre Modern Geography

1. Development of Geography and contributions of Greek, Chinese, and Indian geographers.
2. Impact of 'Dark Age' on Geography and Arab contributions
3. Geography during the Age of 'Discovery' and 'Exploration' (Contributions of Portuguese Voyages, Columbus, Vasco da Gama, Magellan, Thomas Cook)
4. Transition from Cosmography to Scientific Geography (Contributions of Bernard Varenius and Immanuel Kant); Dualism and Dichotomies (General vs. Particular, Physical vs. Human, Regional vs. Systematic, Determinism vs. Possibilism, Ideographic vs. Nomeothetic)

Unit 2: Foundations of Modern Geography & Recent Trends

1. Evolution of Geographical thoughts in Germany, France, Britain and United States of America.
2. Contributions of Humboldt and Ritter
3. Contributions of Richthofen, Hettner and Ratzel
4. Schools of geographical thought: French, British and American;
5. Trends of Geography in the post World War-II period
6. Evolution of Geography in India: formative periods, establishments and emerging trends
7. Quantitative Revolution and its impact, behaviouralism, systems approach, radicalism, feminism
8. Towards Post Modernism: Changing concept of space in geography. Geography in the 21st Century

Reading References:

- Arentsen M., Stam R. and Thuijis R., 2000: Post-modern Approaches to Space, ebook.
- Bhat, L.S. (2009) Geography in India (Selected Themes). Pearson
- Bonnett A., 2008: What is Geography? Sage.
- Dikshit R. D., 1997: Geographical Thought: A Contextual History of Ideas, Prentice–Hall India.
- Hartshone R., 1959: Perspectives of Nature of Geography, Rand MacNally and Co.
- Holt-Jensen A., 2011: Geography: History and Its Concepts: A Students Guide, SAGE.
- Johnston R. J., (Ed.): Dictionary of Human Geography, Routledge.
- Johnston R. J., 1997: Geography and Geographers, Anglo-American Human Geography since 1945, Arnold, London.
- Kapur A., 2001: Indian Geography Voice of Concern, Concept Publications.

- Martin Geoffrey J., 2005: All Possible Worlds: A History of Geographical Ideas, Oxford.
- Soja, Edward 1989. Post-modern Geographies, Verso, London. Reprinted 1997: Rawat Publ., Jaipur and New Delhi.

CC 14 – Geographical Information System

Concepts in Theory

1. Nature of Geographic Information System, Measuring Systems: Location – Coordinate Systems
2. Data Representation: Topology and Attributes, Spatial Data Models: Raster and Vector data models
3. GIS Database Creation and Maintenance, DBMS and its use in GIS, GIS-based Modelling and Spatial Overlay
4. Spatial Modelling with GIS: Application in Physical Geography and Human Geography, Web-GIS.

List of Practical

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

1. Georeferencing of maps and images, Topology Creation
2. Data attachment and Creation of DBMS
3. Thematic Mapping : Morphometric Analysis and Choropleth Mapping
4. Application of Web-GIS for Creation of Information Layer.

Reading References:

- Jatin Pandey and Darshana Pathak, 2013, Geographic Information System, TERI Publishing House.
- Chor Pang Lo, 2009, Concepts and Techniques of Geographic Information System, Prentice Hall.

Michael N. Demers, 2012, Fundamentals of Geographic Information Systems, Willy.

DSE 4-Soil and Biogeography

Concepts in Theory

1. Factors or soil formation. Man as an active agent of soil transformation.
2. Soil profile. Origin and profile characteristics of Lateritic, Podzol and Chernozem soils
3. Definition and significance of soil properties: Texture, structure and moisture,
4. Definition and significance of soil properties: pH, organic matter and NPK
5. Soil erosion and degradation: Factors, processes and mitigation measures
6. Principles of soil classification: Genetic and USDA. Concept of land capability and its classification.
7. Concepts of biosphere, ecosystem, biome, ecotone, community and ecology
8. Concepts of trophic structure, food chain and food web. Energy flow in ecosystems
9. Geographical extent and characteristic features of: Tropical rain forest, Taiga and Grassland biomes
10. Bio-geochemical cycles with special reference to carbon dioxide and nitrogen
11. Deforestation: Causes, consequences and management
12. Bio-diversity: Definition, types, threats and conservation measures

Reading References:

- Biswas, T.D. and Mukherjee, S.K. 1997: Textbook of Soil Science, TataMcGraw Hill,
- Brady, N.C. and Weil, R.R. 1996. The Nature and Properties of Soil, 11th edition, Longman, London :
- Floth, H.D. 1990. Fundamentals of Soil science, 8th edition, John Wiley and Sons, New York.
- Morgan, R.P.C. 1995 Soil Erosion and Conservation, 2nd edition, Longman, London
- Schwab, G.O., Fangmer, D.D. and Elliot, W.J. 1996. Soil and Water Management Systems, 4th edition, John Eiley and sons Inc., New York
- Young, A. 2000. Land Resource: Now and Future, Cambridge University Press, Cambridge: 332p. Chapman J.L. and Rens, M.J. 1993. Ecology: Principle and Applications, Cambridge University Press, Cambridge:
- Chairas, D.D. Reganold , J.P. and Owen, O.S. 2002. National Resource Conservation and management for a Sustainable Future, 8th edition, Prentice Hall, Lo—glewood Cliffs
- Dash, M.C., 2001. Fundamental of Ecology, 2nd edition, Tata McGrawHill, New Delhi
- Huggett, R. 1998. Fundamentals of Biogeography, Routledge, London:
- Kormondy, E.J. 1996. Concept of Ecology, 4th edition, Prentice- Hall, India, New Delhi
- Myers, A. A. and Giller, P.S. (editors) 1988. Analytical Biogeography: an Integrated Approach to the Study of Animal and Plant Distribution. Chapman and Hall, London

DSE 5 – Social Geography

Unit 1:

1. Social Geography: Concept, Origin, Nature and Scope
2. Concept of Space, Social differentiation and stratification; social processes
3. Social Categories: Caste, Class, Religion, Race and Gender and their Spatial distribution
4. Basis of Social region formation; Evolution of social-cultural regions of India
5. Peopling Process of India: Technology and Occupational Change; Migration.
6. Social groups, social behaviour and contemporary social environmental issues with special reference to India

Unit 2:

1. Concept of Social Well-being, Quality of Life, Gender and Social Well-being
2. Measures of Social Well-being: Healthcare, Education, Housing, Gender Disparity
3. Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime.
4. Social Planning during the Five Year Plans in India
5. Social Policies in India: Education and Health
6. Social Impact Assessment (SIA): Concept and importance

Reading References:

- Ahmed A., 1999: Social Geography, Rawat Publications.
- Casino V. J. D., Jr., 2009) Social Geography: A Critical Introduction, Wiley Blackwell.
- Cater J. and Jone.s T., 2000: Social Geography: An Introduction to Contemporary Issues, Hodder Arnold.
- Holt L., 2011: Geographies of Children, Youth and Families: An International Perspective, Taylor & Francis.
- Panelli R., 2004: Social Geographies: From Difference to Action, Sage.
- Rachel P., Burke M., Fuller D., Gough J., Macfarlane R. and Mowl G., 2001: Introducing Social Geographies, Oxford University Press.
- Smith D. M., 1977: Human geography: A Welfare Approach, Edward Arnold, and London.
- Smith D. M., 1994: Geography and Social Justice, Blackwell, Oxford.
- Smith S. J., Pain R., Marston S. A., Jones J. P., 2009: The SAGE Handbook of Social Geographies, Sage Publications.
- Sopher, David (1980): An Exploration of India, Cornell University Press, Ithasa
- Valentine G., 2001: Social Geographies: Space and Society, Prentice Hall.

DSE 6- Political Geography

Concepts in Theory

1. Nature and scope Political Geography
2. Concept State, Nation and Nation State
3. Attributes of State – Frontiers, Boundaries, Exclave and exclave, Shape, Size, Territory and Sovereignty
4. Geopolitics and geopolitical theories: Heartland and Rimland
5. Electoral Geography – Geography of Voting, Geographic Influences on voting pattern,
6. Geography of Representation, Gerrymandering.
7. Political Geography of Conflicts of resource– Oil, water and emission of green house gases
8. Inter-state dispute on water resources of India.
9. The Indian context of conflicts over forest rights.
10. Geographical basis of Indian federalism; Emergence of new states
11. Politics of Displacement: Issues of relief, compensation and rehabilitation: with reference to Dams and Special Economic Zones of India
12. Territorial politics: Case studies of Jammu and Kashmir, Assam and GTA

Reading References:

- Ahmed A., 1999: Social Geography, Rawat Publications.
- Casino V. J. D., Jr., 2009) Social Geography: A Critical Introduction, Wiley Blackwell.
- Cater J. and Jones T., 2000: Social Geography: An Introduction to Contemporary Issues, Hodder Arnold.
- Holt L., 2011: Geographies of Children, Youth and Families: An International Perspective, Taylor & Francis.
- Panelli R., 2004: Social Geographies: From Difference to Action, Sage.
- Rachel P., Burke M., Fuller D., Gough J., Macfarlane R. and Mowl G., 2001: Introducing Social Geographies, Oxford University Press.
- Smith D. M., 1977: Human geography: A Welfare Approach, Edward Arnold, and London.
- Smith D. M., 1994: Geography and Social Justice, Blackwell, Oxford.
- Smith S. J., Pain R., Marston S. A., Jones J. P., 2009: The SAGE Handbook of Social Geographies, Sage Publications.
- Sopher, David (1980): An Exploration of India, Cornell University Press, Ithasa
- Valentine G., 2001: Social Geographies: Space and Society, Prentice Hall.

GE 1 – Climate Change: Vulnerability and Adaptation

Syllabus:

Unit 1: Elements of the Atmosphere

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 and Climatic Classification

1. Condensation: Process 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, index cycle
6. Tropical and mid-latitude cyclones
7. Monsoon circulation and mechanism with reference to India
8. Climatic classification after Köppen, Thornthwaite and Oliver

Reading References:

- Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.

- Barry R. G. and Corley 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

GE 2 – Rural Development

Syllabus:

Concepts in Theory

1. Defining Development: Inter-Dependence of Urban and Rural Sectors of the Economy
2. Paradigms of Rural Development: Lewis Model of Economic Development, 'Big Push' theory of Development, Myrdal's thesis of 'Spread and Backwash Effects'
3. Need for Rural Development, Gandhian Approach to Rural Development
4. Rural Economic Base: Agriculture and Allied Sectors, Seasonality and Need for expanding Non-Farm Activities,
5. Rural Co-operatives and agricultural marketing
6. Area Based Approach to Rural Development: Drought Prone Area Programmes, PMGSY
7. Target Group Approach to Rural Development: SJSY, MNREGA, Jan DhanYojana
8. Provision of Services – Physical and Socio-Economic Access to Elementary Education and Primary Health Care and Micro credit; Concept of PURA
9. Rural Governance: Panchayati Raj System, Rural Development Policies and Programmes in India
10. Rural Infrastructural Development programmes relating to: Rural Electrification,
11. Transport, Housing, and Connectivity
12. Rural Development Programmes for Women and children: JananiSurakshaYojana , National Nutrition Mission, Drinking water and sanitation programmes, NRHM, SarvaSikha Mission

Reading References:

- Gilg A. W., 1985: An Introduction to Rural Geography, Edwin Arnold, London.

- Krishnamurthy, J. 2000: Rural Development - Problems and Prospects, RawatPubls., 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 – Leaning 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.

First Semester				
Course Code	**Course Title**	**Course Type**	**(L-P-Tu)**	**Credit**
BGEOCCHT101	CC 1 – Geotectonics and Geomorphology	CC-1	5-0-1	6
BGEOCCHS102	CC 2 – Cartographic Techniques	CC-2	0-6-0	6
**103	**One from pool of Generic Electives**	GE-1		6
BAECCEST104	Environmental Studies	AECC-1	2-2-0	4
Total				***22***

Second Semester				
Course Code	**Course Title**	**Course Type**	**(L-P-Tu)**	**Credit**
BGEOCCHT201	CC 3 – Hydrology and Oceanography	CC-3	5-0-1	6
BGEOCCHS202	CC 4 – Cartograms and Thematic Mapping	CC-4	0-6-0	6
**203	**One from pool of Generic Electives**	GE-2		6
**204	**One from pool of AECC-MIL (ENGLISH / MIL)**	AECC-2	2-0-0	2
Total				***20***

BACHELOR OF ARTS (BA) AND BACHELOR OF SCIENCE(BSC) HONOURS IN

Third Semester				
Course Code	**Course Title**	**Course Type**	**(L-P-Tu)**	**Credit**
BGEOCCHT301	CC 5 – Climatology	CC-5	5-0-1	6
BGEOCCHT302	CC 6 – Geography of India	CC-6	5-0-1	6
BGEOCCHS303	CC 7 – Statistical Methods in Geography	CC-7	0-6-0	6
**304	**One from pool of Generic Electives**	GE-3		6
BGEOSEHT305	SE 1 – Disaster Management	SEC-1	2-0-0	2
Total				***26***

GEOGRAPHY (Continued)

Fourth Semester				
Course Code	**Course Title**	**Course Type**	**(L-P-Tu)**	**Credit**
BGEOCCHT401	CC 8 – Regional Planning and Development	CC-8	5-0-1	6
BGEOCCHT402	CC 9 – Economic Geography	CC-9	5-0-1	6
BGEOCCHS403	CC 10 – Remote Sensing	CC-10	0-6-0	6
**404	**One from pool of Generic Electives**	GE-4		6
BGEOSEHS405	SE 2- Advanced Spatial Statistical Techniques	SEC-2	2-0-0	2
Total				***26***

BACHELOR OF ARTS (BA) AND BACHELOR OF SCIENCE(BSC) HONOURS IN

Fifth Semester				
Course Code	**Course Title**	**Course Type**	**(L-P-Tu)**	**Credit**
BGEOCCHT501	CC 11 – Environmental Geography	CC-11	5-0-1	6
BGEOCCHS502	CC 12 – Research Methodology and Field Work	CC-12	0-6-0	6
**503	**One from pool of Discipline Specific Electives**	DSE-1		6
**504	**One from pool of Discipline Specific Electives**	DSE-2		6
Total				***24***

GEOGRAPHY (Continued)

Sixth Semester				
Course Code	**Course Title**	**Course Type**	**(L-P-Tu)**	**Credit**
BGEOCCHT601	CC 13 – Evolution of Geographical Thought	CC-13	5-0-1	6
BGEOCCHS602	CC 14 – Geographical Information System	CC-14	0-6-0	6
**603	**One from pool of Discipline Specific Electives**	DSE-3		6
**604	**One from pool of Discipline Specific Electives**	DSE-4		6
Total				***24***

CBCS Syllabus of Geography Programme Course

SKBU, Purulia

SEMESTER-I

SC 1 – Geotectonics and Geomorphology

Unit 1: Geotectonics

1. Earth's tectonic and structural evolution with reference to geological time scale
2. Earth's interior with special reference to seismology. Isostasy: Models of Airy and Pratt
3. Plate Tectonics: Processes at constructive, conservative, destructive margins and hotspots; resulting landforms
4. Folds and Faults—origin and types

Unit 2: Geomorphology

1. Degradational processes: Weathering, mass wasting and resultant landforms
2. Processes of entrainment, transportation and deposition by different geomorphic agents. Role of humans in landform development.
3. Development of river network and landforms on uniclinal and folded structures
4. Landforms on igneous rocks with special reference to Granite and Basalt
5. Karst landforms: Surface and sub-surface
6. Glacial and fluvio-glacial processes and landforms; fluvio-glacial landforms
7. Aeolian and fluvio-aeolian processes and landforms; fluvio-aeolian processes
8. Models on landscape evolution: Views of Davis, Penck, King and Hack

Reading References:

- 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, Robert W., (2011), Geosystems: An Introduction to Physical Geography, 8th 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, Brian J. and Stephen C. Porter (2000), The Dynamic Earth: An Introduction to physical Geology, 4th Edition, John Wiley and Sons
- Thornbury W. D., 1969: Principles of Geomorphology, Wiley.

SEMESTER-II

SC 2 – Hydrology and Oceanography

Unit 1: Hydrology

1. Systems approach in hydrology. Global hydrological cycle: Its physical and biological role
2. Run off: controlling factors. Infiltration and evapotranspiration. Run off cycle
3. Drainage basin as a hydrological unit. Principles of water harvesting and watershed management
4. Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement.

Unit 2: Oceanography

1. Major relief features of the ocean floor: characteristics and origin according to plate tectonics.
2. Physical and chemical properties of ocean water
3. Water mass, T–S diagram
4. Air-Sea interactions, ocean circulation, wave and tide.
5. Ocean temperature and salinity: Distribution and determinants.
6. Coral reefs: Formation, classification and threats.
7. Marine resources: Classification and sustainable utilisation
8. Sea level change: Types and causes

Reading References:

- Andrew. D. Ward and Stanley, Trimble (2004): Environmental Hydrology, 2nd edition, Lewis Publishers, CRC Press.
- Karanth, K.R., 1988: Ground Water: Exploration, Assessment and Development, Tata-McGraw Hill, New Delhi.
- Ramaswamy, C. (1985): Review of floods in India during the past 75 years: A Perspective. Indian National Science Academy, New Delhi.
- Rao, K.L., 1982: India's Water Wealth 2nd edition, Orient Longman, Delhi,
- Singh, Vijay P. (1995): Environmental Hydrology. Kluwer Academic Publications, the Netherlands.
- Anikouchine W. A. and Sternberg R. W., 1973: The World Oceans: An Introduction to Oceanography, Prentice-Hall.
- Garrison T., 1998: Oceanography, Wordsworth Company, Belmont.
- Kershaw S., 2000: Oceanography: An Earth Science Perspective, Stanley Thornes, And UK.
- Pinet P. R., 2008: Invitation to Oceanography (Fifth Edition), Jones and Barlett Publishers, USA, UK and Canada.
- Sverdrup K. A. and Armrest, E. V., 2008: An Introduction to the World Ocean, McGraw Hill, Boston.
- Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Landscape ecology and water management.Proceedings of IGU Rohtak Conference, Volume 2.Advances in Geographical and Environmental Studies, Springer.

SEMESTER-III

SC 3 – Cartographic Techniques

Concepts in Theory

1. Maps: Classification and types. Components of a map.
2. Concept and application of scales: Plain, comparative, diagonal and vernier
3. Coordinate systems: Polar and rectangular. Concept of geoid and spheroid
4. Concept of generating globe. Grids: angular and linear systems of measurement
5. Bearing: Magnetic and true, whole-circle and reduced.
6. Map projections: Classification, properties and uses. Concept and significance of UTM projection.
7. Basic concepts of surveying and survey equipment: Prismatic compass, dumpy level, theodolite, Abney level, clinometer.
8. Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps

List of Practical

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

1. Graphical construction of scales: Linear, Comparative linear and Diagonal scale.
2. Construction of projections: Polar Zenithal Stereographic, Simple conic with One standard parallels, Cylindrical Equal Area and Mercator's Projection.
3. Construction and interpretation of relief profiles (superimposed, projected and composite), Identification of drainage pattern, settlement pattern and road network.
4. Correlation between physical and cultural features from Survey of India topographical maps. using transect chart.

Reading References:

- 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.
- Rhind D. W. and Taylor D. R. F., (eds.), 1989: Cartography: Past, Present and Future, Elsevier, International Cartographic Association.
- 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

SE 1 – Regional Planning and Development

Unit 1: Regional Planning

1. Concept of regions: Types of regions and their delineation.
2. Types of planning, principles and objectives of regional planning, multi- level planning in India
3. Tools and techniques of regional planning, need for regional planning in India
4. Metropolitan concept: metropolitan areas, and urban agglomerations

Unit 2: Geography of West Bengal

1. Development: Meaning, growth versus development
2. Concept and strategies of regional development with reference to India
3. Theories and models for regional development : Growth pole model of perroux; growth centre model in Indian context
4. Theories and models for regional development: Cumulative causation (Myrdal) and core periphery (Hirschman, Rostov and Friedman)
5. Changing concept of development, concept of underdevelopment; efficiency-equity debate
6. Indicators of development: Economic, social and environmental. Human development.
7. Regional development in India, regional inequality, disparity and diversity
8. Need and measures for balanced development in India

Reading References:

- Berry, BJ.L. and Horton, F.F. (1970): Geographic Perspectives on Urban Systems. Prentice Hall, New Jersey.
- Bhat L.S. (1972): Regional Planning In India, Statistical Publishing Society
- Blij H. J. De, 1971: Geography: Regions and Concepts, John Wiley and Sons.
- Chand ,M and Puri V.K. (1983) : Regional planning In India , allied publishers , New Delhi
- ClavalP.l, 1998: An Introduction to Regional Geography, Blackwell Publishers, Oxford and Massachusetts.
- Friedmann J. and Alonso W. (1975): Regional Policy - Readings in Theory and Applications, MIT Press, Massachusetts.
- Gore C. G., Köhler G., Reich U-P. andZiesemer T., 1996: Questioning Development; Essays on the Theory, Policies and Practice of Development Intervention, Metropolis-Verlag, Marburg.
- Hall, P. (1992): Urban and Regional Planning, Routledge, London.
- Haynes J., 2008: Development Studies, Polity Short Introduction Series.
- Johnson E. A. J., 1970: The Organization of Space in Developing Countries, MIT Press, Massachusetts.
- Kulshetra ,S.K,(2012) : Urban and Regional Planning in India : A hand book for Professional Practioners , Sage Publication , New Delhi

- Kundu, A. (1992): Urban Development Urban Research in India, Khanna Publ. New Delhi.
- Misra , R.P, Sundaram K.V, PrakashRao , VLS(1974): Regional Development Planning in India , Vikas Publication , New Delhi
- Misra, R.P (1992): Regional Planning: Concepts , techniques , Policies and Case Studies , Concept New Delhi
- Peet R., 1999: Theories of Development, The Guilford Press, New York.
- UNDP 2001-04: Human Development Report, Oxford University Press.
- World Bank 2001-05: World Development Report, Oxford University Press, New Delhi

SEMESTER-IV

SC 4 – Economic Geography

Unit 1: Introduction

1. Meaning and approaches to Economic Geography, new Economic Geography
2. Concepts in Economic Geography: Goods and services, production, exchange and consumption
3. Concept of economic man, theories of choices
4. Economic distance and transport costs

Unit 2: Economic Activities

1. Concept and classification of economic activities
2. Factors affecting location of economic activity with special reference to agriculture (Von Thunen), and industry (Weber).
3. Primary activities: Subsistence and commercial agriculture, forestry, fishing and mining
4. Secondary activities: Manufacturing (cotton textile, iron and steel), concept of manufacturing regions, special economic zones and technology parks
5. Tertiary activities: transport, trade and services
6. Agricultural systems: Case studies of tea plantation in India and mixed farming in Europe
7. Transnational sea-routes, railways and highways with reference to India
8. International agreements and trade blocs: GATT and OPEC

Reading References:

- Alexander J. W., 1963: Economic Geography, Prentice-Hall Inc., Englewood Cliffs, New Jersey.
- Coe N. M., Kelly P. F. and Yeung H. W., 2007: Economic Geography: A Contemporary Introduction, Wiley-Blackwell.

- Hodder B. W. and Lee Roger, 1974: Economic Geography, Taylor and Francis.
- Combes P., Mayer T. and Thisse J. F., 2008: Economic Geography: The Integration of Regions and Nations, Princeton University Press.
- Wheeler J. O., 1998: Economic Geography, Wiley.
- Durand L., 1961: Economic Geography, Crowell.
- Bagchi-Sen S. and Smith H. L., 2006: Economic Geography: Past, Present and Future, Taylor and Francis.
- Willington D. E., 2008: Economic Geography, Husband Press.
- Clark, Gordon L.; Feldman, M.P. and Gertler, M.S., eds. 2000: The Oxford

SE 2 – Research Methodology and Field Work

Unit 1: Research Methodology

1. Research in Geography: Meaning, types and significance
2. Literature review and formulation of research design
3. Defining research problem, objectives and hypothesis. Research materials and methods
4. Techniques of writing scientific reports: Preparing notes, references, bibliography, abstract and keywords

Unit 2: Field Work

1. Fieldwork in Geographical studies – Role and significance. Selection of study area and objectives. Pre-field preparations. Ethics of fieldwork
2. Field techniques and tools: Observation (participant, non participant), questionnaires (open, closed, structured, non-structured). Interview with special reverence to focused group discussions.
3. Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording.
4. Positioning and collection of samples. Preparation of inventory from field data. Post-field tasks.

List of Practical

1. Each student will prepare an individual report based on primary data collected form field survey and secondary data collected from different sources for either a rural area (mouza) or an urban area (municipal ward) based on cadastral or municipal maps to study specific problems.
2. The duration of the field work shall not exceed 7 days.
3. The report should be hand written in English on A4 size paper in candidate's own words within 3,000 to 5,000 words excluding figures , tables , photographs , maps , references and appendices
4. A copy of the bound report, duly signed by the concerned teacher, should be submitted.

Reading References:

- Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- Evans M., 1988: “Participant Observation: The Researcher as Research Tool” in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi
- Robinson A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.
- Special Issue on “Doing Fieldwork” The Geographical Review 91:1-2 (2001).
- Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
- Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA

SEMESTER-V

DSE 1 – Geography of India

Unit 1: Geography of India

1. Tectonic and stratigraphic provinces, physiographic divisions
2. Climate, soil and vegetation: Characteristics and classification
3. Population: Distribution, growth, structure and policy
4. Distribution of population by race, caste, religion, language, tribes and their correlates
5. Agricultural regions. Green revolution and its consequences
6. Mineral and power resources distribution and utilisation of iron ore, coal, petroleum, gas;
7. Industrial development: Automobile and information technology
8. Regionalisation of India: Physiographic (R. L. Singh), Socio-cultural (Sopher) and Economic (Sengupta)

Unit 2: Geography of West Bengal

1. Physical perspectives: Physiographic divisions, forest and water resources
2. Population: Growth, distribution and human development
3. Resources: Mining, agriculture and industries
4. Regional Problem: Darjeeling Hills, Jangalmahal and Sundarban

Reading References:

- 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 Intenational Perspective. Vol. 3 – Indian Perspective.
- Sdyasuk Galina and P Sengupta (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, Jagdish 2003: India - A Comprehensive & Systematic Geography, GyanodayaPrakashan, Gorakhpur.
- Spate O. H. K. and Learmonth A. T. A., 1967: India and Pakistan: A General and Regional Geography, Methuen.
- Tirtha, Ranjit 2002: Geography of India, RawatPubls., 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. PrayagPustakBhawan, Allahabad

- Sharma, T.C. (2013) Economic Geography of India. Rawat Publication, Jaipur

Or
DSE 2 – Disaster Management

Unit:1 Concepts in Theory

1. Classification of hazards and disasters.
2. Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms.
3. Responses to hazards: Preparedness, trauma and aftermath. Resilience and capacity building.
4. Hazards mapping: Data and techniques

Unit: 2 Disaster Case Studies

1. Earthquake: Factors, vulnerability, consequences and management
2. Landslide: Factors, vulnerability, consequences and management
3. Cyclone: Factors, vulnerability, consequences and management
4. Fire: Factors, vulnerability, consequences and management

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

An individual Project Report based on any one case study among the following disasters incorporating a preparedness plan in the vicinity of the candidate's institution or residence:

1. Thunderstorm
2. Landslide
3. Flood
4. Coastal / riverbank erosion
5. Fire

Reading References:

- 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.

SEC3

Title:

Statistical Techniques in Geography

Syllabus:

1. Data Sources and Types of Data; Sampling: Sampling plans for spatial and non-spatial data.
2. Study of Frequency Distribution; Measures of Central Tendency: Mean, Median and Mode
3. Correlation and Regression Analysis: Rank order correlation and linear regression
4. Time Series Analysis: Time Series processes; Time series components.

Reading References:

- Bart James E and Gerld M.Barber, 1996: Elementary Statistics for Geographers, The Guieford Press, London.
- Eldon, D., 1983: Statistics in Geography: A Practical Approach, Blackwell, London.
- Cressie, N.A.C., 1991: Statistics for Spatial Analysis, Wiley, New York.
- Gregory, S., 1978: Statistical Methods and the Geographer (4th Edition), Longman, London.
- Haining, R.P., 1990: Spatial Data Analysis in the Social and Environmental Science, Cambridge University Press, Cambridge.
- Mc Grew, Jr. and Cahrles, B. M., 1993: An Introduction to Statistical Problem Solving in Geography,
- W.C. Brocan Publishers, New Jersey.
- Mathews, J.A., 1987: Quantitative and Statistical Approaches to Geography: A Practical Manual Pergamon, Oxford.
- S.K., 1998: Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi.
- Wei, W.S., 1990: Time Series Analysis: Variate and Multivariate Methods, Addison Wesley Publishing.
- Yeates, Mauris, 1974: An Introduction to Quantitative Analysis in Human Geography, Mc Grawhill, New York

GE 1 – Climate Change: Vulnerability and Adaptation

Unit 1: Elements of the Atmosphere

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 and Climatic Classification

1. Condensation: Process 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, index cycle
6. Tropical and mid-latitude cyclones
7. Monsoon circulation and mechanism with reference to India
8. Climatic classification after Köppen, Thornthwaite and Oliver

Reading References:

- Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
- Barry R. G. and Corley 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

SEMESTER-VI

DS 3 – Population Geography

Unit: 1 Population Dynamics

1. Development of Population Geography as a field of specialization. Relation between population geography and demography.
2. Sources of population data, their level of reliability and problems of mapping
3. Population distribution: Density and growth. Classical and modern theories on population growth, Demographic transition model
4. World patterns and determinants of population distribution and growth. Concept of optimum population

Unit: 2 Population Growth Pattern in India

1. Population distribution, density, and growth in India
2. Population composition of India: Urbanisation and occupational structure
3. Migration: Types and Causes; National and international patterns of migration with reference to India
4. Population policies in developed and less development countries. India's population policies.

Reading References:

- Barrett, H.R. 1995. Population Geography, Oliver and Boyd.
- Bartram, D. Poros, M. Monforte, P. 2014. Key Concepts in Migration, Sage.
- Binde, N., Kanitkar, H. 2000. The Principle of Population Studies, Himalaya Publications.
- Chandna, R.C. 2016. Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers.
- Dyson,T. 2011. Population and Development: The Demographic Transition, Rawat Publications.

- Gregory, D., Johnston, R., Pratt, G., Watts, M., Whatmore, S. (Eds) 2009. The Dictionary of Human Geography, 5th ed,
- Wiley. Hassan, M.I. 2005. Population Geography, Rawat publications.
- Hussain, M. 1994. Human Geography, Rawat publications.
- Jhingan, M.L., Bhatt, B.K., Desai, J.N. 2014. Demography, Vrinda Publications.
- Jones, H. R. 2000. Population Geography, 3rd ed, Chapman
- Lutz, W., Warren, C.S., Scherbov, S. 2004. The End of the World Population Growth in the 21st Century, Earthscan.
- Majumdar, P.K. 2013. India's Demography: Changing Demographic Scenario in India, Rawat Publications.
- Mukherji, S. 2013. Migration in India: Links to Urbanization, Regional Disparities and Development Policies, Rawat Publications
- Newbold, K.B. 2017. Population Geography: Tools & Issues, 3rd ed, Rowman& Littlefield Publishers.
- Pacione, M. 2012. Population Geography: Progress and Prospect, Routledge

Or

DS 4 – Geography of Tourism

Unit: 1 Concept in Theory

1. Concepts, Nature and Scope; Inter-Relationships of Tourism, Recreation and Leisure; Geographical Parameters of Tourism by Robinson.
2. Type of Tourism: Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage Tourism
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

Unit: 2 Tourism in India

1. Tourism in India: Tourism Infrastructure; Case Studies of Himalaya, Desert and Coastal and Heritage; National Tourism Policy
2. Promotion of tourism: National tourism policy. Role of Internet
3. Geomorphosites in India
4. Tourism circuits-short and longer detraction: Agencies and intermediaries, Indian hotel industry

Reading References:

- Boniface, B., Cooper, R., Cooper, C. 2016. Worldwide Destinations: The Geography of Travel and Tourism, vol. 1, 7th ed, Routledge.
- Edgell, D.L., Swanson, J. 2013. Tourism Policy and Planning: Yesterday, Today, and Tomorrow, Routledge.
- Fennell, D.A.2014. Ecotourism, 4th ed, Routledge. Hall, C.M., Lew, A.A. 2009. Understanding and Managing Tourism Impacts: An Integrated Approach, Routledge.
- Hall, C.M., Page, S.J. 2014.The Geography of Tourism and Recreation: Environment, Place and Space 4th ed, Routledge.
- Honey, M. 2008. Ecotourism and Sustainable Development, Second Edition: Who Owns Paradise? 2nd ed, Island Press.
- Kale, V.S. (Ed) 2017. Geomorphosites of India, Indian Institute of Geomorphologists.
- Lew, A., Hall, C.M., Timothy, D.J. 2008. World Geography of Travel and Tourism: A Regional Approach, Butterworth-Heinemann.
- Var, T., Gunn, C. Tourism Planning: Basics, Concepts, Cases, 4th ed, Routledge.
- Velvet, N. 2017. An Introduction to the Geography of Tourism, 2nd ed,
- Rowman& Littlefield Publishers. Williams, S., Lew, A.A. 2014. Tourism Geography: Critical Understandings of Place, Space and Experience, 3rd ed, Routledge.
- Wilson, J. 2017. The Routledge Handbook of Tourism Geographies, Routledge.

SE4: Rural Development

Syllabus:

1. Rural Development: Concept, basic elements, measuring the level of rural development
2. Paradigms of rural development: Cumulative causation model, core-periphery model, Gandhian approach to rural development
3. Area based approach to rural development: Drought prone area programmes, PMGSY, SJSY, MGNREGA, Jan DhanYojana
4. Rural Governance: Panchayati Raj system, rural development policies and programmes in India – an overview

GE 2 – Rural Development

Concepts in Theory

1. Defining Development: Inter-Dependence of Urban and Rural Sectors of the Economy
2. Paradigms of Rural Development: Lewis Model of Economic Development, 'Big Push' theory of Development, Myrdal's thesis of 'Spread and Backwash Effects'
3. Need for Rural Development, Gandhian Approach to Rural Development
4. Rural Economic Base: Agriculture and Allied Sectors, Seasonality and Need for expanding Non-Farm Activities,
5. Rural Co-operatives and agricultural marketing
6. Area Based Approach to Rural Development: Drought Prone Area Programmes, PMGSY
7. Target Group Approach to Rural Development: SJSY, MNREGA, Jan DhanYojana
8. Provision of Services – Physical and Socio-Economic Access to Elementary Education and Primary Health Care and Micro credit; Concept of PURA
9. Rural Governance: Panchayati Raj System, Rural Development Policies and Programmes in India
10. Rural Infrastructural Development programmes relating to: Rural Electrification,
11. Transport, Housing, and Connectivity
12. Rural Development Programmes for Women and children: JananiSurakshaYojana , National Nutrition Mission, Drinking water and sanitation programmes, NRHM, SarvaSikha Mission

Reading References:

- Gilg A. W., 1985: An Introduction to Rural Geography, Edwin Arnold, London.

- Krishnamurthy, J. 2000: Rural Development - Problems and Prospects, RawatPubls., 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 – Leaning 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.