

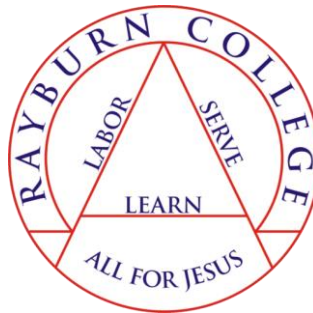
Choice Based Credit System (CBCS)

RAYBURN COLLEGE

(Autonomous, Accredited B++ Grade, 2.96 CGPA out of 4 by NAAC 2023)

Affiliated to M.U: No. MU/1-65/98/CDC/136:07.08.2012.

Recognized by UGC under Section 2(f) & 12(B) of 1956 Act: No.8-29/2015(CPP-I/C):23/04/2015.



DEPARTMENT OF GEOGRAPHY

M.A. Post-Graduate Programme in Geography

**First Semester
Core Course**

GG/411: Geomorphology

Course

Contents

- Unit I: Evolution of geomorphic thought, Fundamental concepts of geomorphology, Concept of climatic geomorphology; Bases of geomorphological processes-physical, chemical, biological and human, Drainage basin as a fundamental geomorphic unit.
- Unit II: Normal cycle of erosion and its characteristics landforms, Interception in the cycle, concept of polycyclic; Slope evolution, slope development and processes, slope classification and mapping
- Unit III: Soil forming processes, physical and chemical properties of soils. Development of soil profile and genetic classification of soils. Major landforms associated with fluvial, glacial, aeolian and karst region.
- Unit-IV Applied geomorphology – application of Geomorphic mapping for terrain evaluation, digital elevation model (DEM), land capability and land suitability classification, Urban geomorphology; Hydro geomorphology; Regional geomorphology of Appalachians, Chotanagpur and Meghalaya plateau.

Suggested Readings:

- Bloom, A.L.: **Geomorphology – A Systematic Analysis of Late Canezoic Landforms**, Prentice Hall Englewood Cliffs N.J. 1978
- Chorley, R.J.: **Spatial Analysis in Geomorphology**, Methuen, London, 1972
- Cooke, R.U. and Doornkamp, J.C.: **Geomorphology in Environmental Management – An Introduction**, Clarendon Press, Oxford, 1974
- Dayal, P.: **A Text Book of Geomorphology**, Patna, 1990
- Dury, G.H.: **The Face of the Earth**, Penguin Harmondsworth, 1959
- Fairbridge, R.W.: **Encyclopaedia of Geomorphology**, Reinholdts, New York, 1968
- Garner, H.F.: **The Origin of landscape – A Synthesis of Geomorphology**, Oxford University Press, London, 1974.
- Goudie, A.: **The Nature of the Environment**, Oxford & Blackwell, London, 1993
- Melhorn, W.N. (ed): **Theories of Landform Development**, George Allen & Unwin, London, 1981
- Mitchell, C.W.: **Terrain Evaluation**, Longman, London, 1973.
- Ollier, C.D.: **Weathering**, Longman, London, 1979.

Pitty, A.F.: **Introduction to Geomorphology**, Methuen, London, 1971.
 Skinner, B.J.& Porter, S.C.: **The Dynamic Earth**, John Wiley, New York, 1995. Sparks, B.W.: **Geomorphology**, Longman, London, 1960.
 Sharma, H.S.(ed): **Perspectives in Geomorphology**, Concept, New Delhi, 1980.
 Singh, S.: **Geomorphology**, Prayag Publication, Allahabad, 1998.
 Stoddart, D.R.(ed): **Process and Form in Geomorphology**, Routledge, New York, 1996.
 Thornbury, W.D.: **Principles of Geomorphology**, John Wiley, New York, 1960.

GG/412: Geographic Thought

Course Content

- Unit I: Ancient Geographic Thoughts: Contributions of Indian, Greek, Roman and Arab geographers.
- Unit II: Emergence of modern geography: Contribution of Varenus, Emmanuel Kant, Carl Ritter and Humboldt; Contributions of German, French, British and American Schools.
- Unit IV: Dichotomies in Geography: Ideographic and Nomothetic, Positivism and empiricism. Recent trends in geography: quantitative revolution in geography, behavioural, humanistic and radical geography and welfare geography.
- Unit V: Areal differentiation, post- modern geography, applied geography concept of models in geography and their classification.

Suggested Readings:

Abler, Ronald; Adams, John S.Gould, Peter: **Spatial Organization: The Geographer's View of the World**, Prentice Hall, N.J., 1971.
 Ali.S.M.: **The Geography of Puranas**, Peoples Publishing House, Delhi, 1966.
 Amedeo, Douglas: **An Introduction to Scientific Reasoning in Geography**, John Wiley, U.S.A., 1971.
 Board, C et al: **Progress in Geography**, Vols I-VIII, Edward Arnold, London, 1970
 Bunge, W: **Theoretical Geography, Lund Studies in Geography**, The Royal University of Lund, Sweden, 1962
 Dishit, R.D. (ed.): **The Art & Science of Geography Integrated Readings**, Prentice Hall of India, New Delhi, 1994.
 Gould, J.R: **An Introduction to Behavioural Geography**, Oxford, 1980
 Gregory, D: **Geographical Imaginations**, Blackwell, Cambridge, Mass, 1994
 Hartshorne, R.: **Perspectives on Nature of Geography**, Rand McNally & Co., 1959.

- Harvey, D: **Explanations in Geography**, Edward Arnold, London, 1969
- Jensen A Holt: **Geography: History and Concepts**, SAGE Publications, 2018
- Husain, M.: **Evolution of Geographic Thought**, Rawat Publishing, Jaipur, 1984.
- James, P.E: **All Possible Worlds: A History of Geographical Ideas**, New York, 1972
- Johnston, R.J.: **Philosophy and Human Geography**, Edward Arnold, London, 1983.
- Johnston, R.J.: **The Future of Geography**, Methuen, London, 1988.
- Minshull, R.: **The Changing Nature of Geography**, Hutchinson University Library, London, 1970.
- Sauer, C.O: **Land Life**, University of California, Berkley, 1963
- Soja, Edward: **Post Modern Geographies**, Verso, London, 1989

GG-413: Natural Resources Management

Course Content

- Unit I: Concept, models and approaches to natural resource management; Problems of resource utilization; population pressure; development and resource use; natural hazard and risk management.
- Unit II: Use and misuse of resources: Global and Indian scenario; prospects of various resources; soil, water, mineral and forests; Conservation and management of resources.
- Unit III: Resource appraisal and policy making: land resources, geophysical, geochemical geobotanical; use of GIS and remote sensing in resource appraisal for decision making policy.
- Unit IV: Resource development: Sustainable resource management, integrated resource development and its application.

Suggested Readings:

- Adams, W.M.: **Green Development: Environment and sustainability in the third world**, Routledge & Chapman Hall, New York, 1990
- Granfelt, T.R., **Managing the Globalised Environment**, J.&L. Composition Ltd. New York, 1999
- Holechek, J.L. et al: **Natural Resources: Eulogy Economics & Policy**, Prentice Hall, New Jersey, 2000
- Hooja, R & Joshi, R. : **Desert drought and Development, Studies in Resource management and sustainability**; Rawat publication, Jaipur, 1994
- Howard, M.C. (ed), **Asia's Environment Crisis**, Westview Press, Prouder, 1993.

- Kates, R.W. & Burton, I (eds): **Geography, Resources and Environment**, Vol I &II, University of Chicago Press, Chicago, 1986
- Newson, ; M.D. **Land , water & development: River Basin System & Management**, Routledge London, 1991.
- Owen, S. & Owens, P.L. **Environment Resources and Conservation**, Cambridge University press, New York, 1991
- Rees, J. : **Natural Resources: Allocation, Economics and policy**, Methuen, London, 1988
- Redcliff, M.: **Sustainable Development: Exploring the Contradiction**, Methuen, London, 1987
- Simmons,I.G. : Earth , air and water: **Resources and Environment in late 20th century**, Edward Arnold, New York, 1991
- Thoman, Alan et.al: **Environmental Policies & NGO influence**, Routledge, London,
- Hamilton, F.E.I.: **Spatial Perspectives on Industrial Organization and Decision Making**, John Wiley, New York, 1974.
- Hamilton, I.(ed.): **Resources and Industry**, Oxford University Press, New York, 1992.
- Isard, W.: **Location and Space Economy**, MIT Press, Cambridge,1956
- Losch, A: **The Economics of Location**, New Haven, 1954
- Pachuri, R.K. **Energy and Economic Development in India**, Praeger, New York, 1977.
- Robertson, D.(ed.): **Globalisation and Environment**, E.Elgar Co., U.K., 2001.

GG-414: Regional Geography of North-East India

Course Content

- Unit I: Location and politico-administrative units, physical characteristic: relief, climate, drainage, soil and vegetation; Natural resources: coal, natural gases, petroleum, forest and water.
- Unit II: Population: population growth and distribution, migration, population characteristics, trends of urbanization, characteristics of urban centres.
- Unit III: Agriculture: Types of farming, cropping pattern, agriculture efficiency, agricultural modernization (problems and prospects)
- Unit IV: Transport, trade & commerce, industrial development, study of Imphal valley, Cachar valley and Brahmaputra valley.

Suggested Readings:

Centre for Science & Environment : **State of India's, Environment**, New Delhi, 1988
 Deshpande C.D.: **India: A Regional Interpretation**, ICSSR & Northern Book Centre, 1992.
 Dreze, Jean & Amartya Sen (ed.): **India Economic Development and Social opportunity** : Oxford University Press, New Delhi, 1996.
 Gopala Krishnan, R.: **Geography of India**, Jawahar, Delhi, 2001
 Kundu A. Raza Moonis: **Indian Economy: the Regional Dimension**. Spectrum Publishers, New Delhi, 1982.
 Robinson, Francis: **The Cambridge Encyclopaedia of India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan & Maldives**, Cambridge University Press, London, 1989.
 Spate OHK & ATA Learmonth: **India & Pakistan**, Methuen, London. 1967.
 Singh R.L. (ed.): **India-A Regional Geography**, National Geographical Society, India, Varanasi, 1971.
 Taher, M and Ahmed, P: **Geography of North East India**, Mani-Manil Prakash, Guwahati, 2000.
 Tirtha R. & Gopal Krishna: **Emerging India**, Reprinted by Rawat Publications, Jaipur, 1996.

GG-415(P): Quantitative Techniques

Course Content

Significance of statistical techniques in geographic studies; Frequency distribution; Graphic representation; Central tendencies – mean, median and mode; Measures of dispersion and skewness; Correlation and regression analysis, Multivariate analysis.

Basic principles of probability; Sampling techniques – random and systematic; Tests of significance; Chi-square test, students' T-test, and F-test; Time series analysis: Trend devices; characteristics and components of a computer system.

Suggested Readings:

- Blackwell, B: **Statistics in Geography**, Basil Blackwell Ltd., 1988
 David Unwin: **Introductory Spatial Analysis**, Methuen, London, 1981.
 Elhance, D.N: **Fundamental of Statistics**, Kitab Mahal, Allahabad, 1972
 Eyles, J. and Smith, D.M. (eds): **Quantitative Methods in Human Geography**, Polity Press, Oxford, 1988.
 Gregory, S. **Statistical Methods and the Geographer**, Longman, London, 1978.
 Hagget, P. and Mc Cullagh, P: **Locational Analysis in Human Geography**, Arnold, London, 1965.
 Hammond R and P.S. McCullagh: **Quantitative Techniques in Geography : An**

- Introduction**, Clarendon Press, Oxford, 1974.
- John P.Cole and Cuchlaine A. M. King: **Quantitative Geography**, John Wiley, London, 1968.
- Johnston R.J: **Multivariate Statistical Analysis in Geography**, Longman, London, 1973.
- King, L.J.: **Statistical Analysis in Geography**, Prentice Hall, Englewood Cliff, N.J.
- Koutsoyiannis: **Theory of Econometrics**, Mcmillan, London, 1973.
- Mahmood, A: **Statistical Methods in Geographical Studies**, Rajesh Publications, New Delhi, 1999.
- Maurice Yeats: **An Introduction to Quantitative Analysis in Human Geography**, McGraw Hill, New York, 1974.
- Mc Cullagh, P.: **Data Use and Interpretation (Science in Geography Series, Part-4)**, Oxford University Press, Oxford, 1988.
- Pal, S.K.: **Statistics for Geoscientists: Techniques and Applications**, Concept Publication, New Delhi, 1999.
- Peter Haggett, Andrew D.Cliff, & Allan Frey: **Location Methods**, Vol. I and II, Edward Arnold, London, 1977.
- Smith, D.M.: **Patterns in Human Geography**, Penguin Book, 1975.

GG-416(P) Geomorphological Mapping & Interpretation

Course Content

Interpretation of geological maps: drawing of profiles, Determination of dip and strike, Measurement of thickness of beds; Interpretation of geological history and correlation of topography with structure.

Drawing and analysis of slope and terrain; Drawing of altimetric histogram and its geomorphological interpretation;

Preparation of long and cross profiles of river valleys, mountainous regions and plateaus; Hyposographic, clinographic and altimetric frequency curves, Slope maps according to Robinson, Raisz & Henry, and Strahler.

Drainage basin analysis; determination of linear, aerial and relief attributes of drainage basins and their relationships.

Preparation of geomorphological map; Russian, French and Polish methods.

Suggested Readings:

Birch, T.W: **Maps – Topographical & Statistical**, Clarendon press, Oxford, 1954

Chow, V.T.: **Handbook of Applied Hydrology**, Mc Graw Hill Book Company, New York, 1964

Dake, C.L. & Brown: **Interpretation of Topographic & Geologic Maps**, McGraw Hill, New York, 1974

Garnet, Alice : **Geographical Interpretation of Topographical Maps**

Gondie, A.: **Geomorphological Techniques**

King, C.A.M.: **Techniques in Geomorphology**, Arnold, London, 1960

Miller, A.A.: **The Skin of the Earth**

Misra, R.P. & Ramesh, A.: **Fundamentals of Cartography**

Monkhouse, F.J. & Wilkinson, H.R.: **Maps and Diagrams**, Methuen and Co.Ltd., New York, 2000

Raisz, Erwin: **Principles of Cartography**, Mc Graw Hill, New York, 1962

Robinson, A.H. & Other : **Elements of Cartography**, John Wiley & Sons, New York

Singh, R.L.: **Elements of Practical Geography**, Kalyani Publishers, Delhi, 1979

Second Semester
Core Course
GG-421: Climatology

Course Content

- Unit I: Nature and scope of climatology, Evolution of atmosphere, Composition and structure of atmosphere; Elements of weather and climate; Insolation, heat balance of the earth and distribution of temperature
- Unit II: Atmospheric pressure and winds; Wind system, monsoon winds and local winds; Jet stream; Atmospheric moisture, and precipitation; Air masses and fronts; Cyclones and anti cyclones.
- Unit III: Climates of the world- tropical, temperate, frigid, desert and mountain climates; Classification of world climate (Koppen/Thornwaite/Trewarth).
- Unit IV: Climate archives; biotic, geological and geochemical climate data and climate models; Tectonic scale climate change; orbital scale climate change ; climate change during the last 1000years and since 1850 AD. Impacts and mitigations .

Suggested Readings:

- Barry, R.G. and Chorley, R.J.: **Atmosphere, Weather and Climate**, Methuen Co.Ltd., London, 1971.
- Barry, R.G. & Chorley P.J.: **Atmosphere, Weather and Climate**, Routledge, London and New York, 1998.
- Blair, T.A.: **Climatology General and Regional**, Prentice Hall, New York, 1942
- Blair, T.A.: **Weather Elements**, Prentice Hall, 1954
- Chorley, R.J.: **Earth, Water and Man**, Methuen and Co., London
- Critchfield, J.H.: **General Climatology**, Prentice Hall, India, New Delhi, 1993.
- Crowe, P.R.: **Concept in Climatology**, Longmans, London, 1971 Das, P.K.: **Monsoons**, National Book Trust, New Delhi, 1987.
- Fein, J.S. and Stephens, P.N. : **Monsoons**, Wiley Interscience, 1987.
- Griffith, J.F.: **Applied Climatology**, Oxford University Press, 1966
- Hobbs, J.E.: **Applied Climatology**, Butterworths, 1980
- India Met. Deptt.: **Climatological Tables of Observatories in India**, Govt.of India, 1968.
- Lal, D.S.: **Climatology**, Chattanya Publications, Allahabad, 1986.
- Lydolph, P.E.: **The Climate of the Earth**, Rowman, 1985.
- Menon, P.A.: **Our Weather**, N.B.T., New Delhi, 1989.
- Peterson, S.: **Introduction to Meteorology**, McGraw Hill Book, London, 1969.
- Robinson, P.J.& Henderson S.: **Contemporary Climatology**, Nenlow, 1999.
- Robinson P.J. and Petty A.(ed): **Applied Climatology –Principles and Practices**, Routledge, London, 1997.

Rumney, George, R.: **Climatology and World's Climates**, McMillan, London, 1968
 Ruddiman, W.F.: **Earth's Climate Past and Future**, WH Freeman, 2009
 Stringer, E.N.: Hoirn, L.A.: **An Introduction to Climate**, International Series, 1982, 1980
 Thompson, R.D. & Perry, A.(ed.): **Applied Climatology, Principles and Practice**, Routledge, London, 1997.
 Trewartha, G.T. & L.H.Horn: **An Introduction to climate**, McGraw Hill Book Company, 1980.
 Gates, E.S.: **Meteorology and Climatology**, Harrap Ltd., London, 1982.
 Oliver, T.K. and Hidare: **Climatology and Introduction**, Bell and Howell Company, London, 1984.

GG-422 :Oceanography

Course Content

Unit I: Nature and scope of oceanography – History of oceanography; distribution of land and water; major features of ocean basins; continental margin and deep-ocean basins; earth structure and Plate tectonics; marine sediments.

Unit II: Physical and chemical properties of sea water; Interlink between atmospheric circulation and circulation patterns in the oceans; Surface currents; thermohaline, waves and tides.

Unit III: Major marine environments: bio-geochemical cycles in the ocean, biozones, types of organisms; food and mineral resources of the sea; Coastal: estuaries, deltas, barrier island, rocky coasts – Open: reefs, continental-shelf, continental – slope and deep, pelagic environment and floor of the ocean basins.

Unit IV: Impact of humans on the marine environment. Law of the sea; exclusive economic zone, marine deposits and formation of coral – reefs.

Suggested Readings:

Davis, Richard J.A.: **Oceanography – An Introduction to the Marine Environment**, Wm. C. Brown Iowa, 1986

Duxbury, C.A. and Duxbury B.: **An Introduction to the world's oceans** – C. Frown, Iowa 2nd ed. 1996.

Garrison, T.: **Oceanography – An Introduction to Marine Science**, Books/Cole, Pacific Grove, USA, 2001.

Growss, M.Grant: **Oceanography, a View of the earth**, Prentice Hall Inc. New Jersey, 1987.

King, C.A.M. **Oceanography for Geographers**, 1962.

Sharma, R.C. : **The Oceans**, Rajesh Publications, New Delhi, 1985.

Ummerkutty, A.N.P. : **Science of the Oceans and Human Life**, NBBT, New Delhi, 1985.

GG-423: Population Geography

Course Content

Unit-I: Nature, Scope and Significance to Study Population Geography. Sources of Population Data: Censuses, Vital Registration, and Sample Surveys. World Population: Growth and Distribution. Population Growth in India and Growth Differential in Indian States/UTs. Theories in Population Growth: Malthusian, Marxist and Socialist View, Neo-Malthusian, and Demographic Transition Model (DTM).

Unit-II: Age-Sex Structure and Its Implications. Nuptiality and Squeeze in India. Socioeconomic Consequences of Aging; Social Security for Elderly in India. Workers and Work Participation Rate in India.

Unit-III: Fertility: Basic Measures; Levels, Trends and Patterns in India. Mortality and Health: Measures of Mortality; Epidemiological Transition; Global Pattern of Causes of Death. Concepts, Measures, and Importance of Migration with Special Reference to Labour Migration in India. Theories of Migration: E.G. Ravenstein, Everett S. Lee, Wilbur Zelinsky, W. Arthur Lewis, and Harris-Todaro.

Unit-IV: Population, Environmental and Development: Concepts of Under Population and Over Population.

Environmental Protocols with Special Reference to India. Hunger and Undernourishment. Population Policies in India.

Suggested Readings:

- Bhende A. and Kanitkar T., **Principles of Population Studies**, Himalaya Publishing House, 2000
- Srinivasan, K., **Population Concerns in India: Shifting Trends, Policies and Programs**. Sage, India, 2017
- Bilasborrow, Richard E and Daniel Hogan: **Population and Deforestation in the Humid Tropics, International Union for the Scientific Study of Population**, Belgium, 1999.
- Boque, D.J. : **Principles in Demography**, John Wiley, New York, 1969.
- Bose, Ashish et. al. : **Population in India's Development (1947-2000)**; Vikash Publishing House, New Delhi, 1974.
- Census of India: India : **A State Profile**, 1991.
- Chandra, R.C.: **Geography of Population; Concept, Determinants and Patterns**, Kalyani Publishers, New York, 2000.
- Clarke, John I.: **Population Geography**, Pergamon Press, Oxford 1973.
- Crook, Nigel: **Principles of Population and Development**, Pergamon Press, New York, 1997.

- Daugherty, Helen Gin, Kenneth C.W. Kammeyir: **An Introduction to Population** (Second Edition), The Guilford Press, New York, London, 1998.
- Garnier, B.J.: **Geography of Population**, Longman, London, 1970.
- Kochhar, Rajesh: **The Vedic People: Their History and Geography**, Orient Longman Ltd., New Delhi, 2000.
- Mamoria, C.B. : **India's Population Problem**, Kitab Mahal New Delhi, 1981.
- Mitra, Ashok, **India's Population : Aspects of Quality and Control**. Vol.I &II, Abhinav Publications, New Delhi, 1978.
- Premi, M.K., **India's Population: Heading Towards a Billion**, B.R. Publishing Corporation, 1991.
- Srinivasan, K. and M. Vlassoff. **Population Development Nexus in India: Challenges for the New Millennium**. Tata McGraw Hill, New Delhi, 2001.
- Srinivasan, K. **Basic Demographic Techniques and Applications**, Sage Publications, New Delhi, 1998.
- Sundaram K.V. and Sudesh Nangia, (ed.), **Population Geography, Heritage Publications**, Delhi, 1986.
- UNDP: **Human Development Report**, Oxford University Press, Oxford 2000.
- United Nations: **Methods for Projections of Urban and Rural Populations**, No.VIII, New York 1974.
- Woods, R. **Population Analysis in Geography**, Longman, London 1979.
- Zelinsky Wilbur, A. **Prologue to Population Geography**, Prentice Hall, 1966.

GG-424: Geography and Ecosystem

Course Content

- Unit I: Concept of ecology and ecosystem; Geography as human Eco-system form and function: trophic level, ecological pyramids, ecological niche, energy and nutrients in the ecosystem, food chains and food webs.
- Unit II: Major terrestrial ecosystem of the world: Agriculture, forests, grasslands and deserts, carrying capacity of the earth.
- Unit III: Man-environment relationship: Resource use and ecological imbalance with reference to soil, forests, and energy resources; Biodiversity, Preservation and conservation of the ecosystem, ecology of tropical farming system, mountain ecosystem with special reference to hills of North- East India.
- Unit IV: Environmental legislation: The Stockholm Conference, the Earth Summit, Environmental laws in India (the Wild Life Act. Water Act, Forest Act, Environment Protection Act and National Environment Tribunal Act).

Suggested Readings:

- Arbill, R. : **Man and Environment : Crisis and Strategy of Choice**, Penguin, Harmondsworth, 1967.
- Berril, N.J. : **Inherit the Earth – The Story of Man and Changing Planet** Fawcett, Greenwich, Connecticut, 1967.
- Botkin, Daniel B. and Keller., Edward A. : **Environmental Studies**, Charles E. Merrill Publishing Co., Columbus, Ohio, 1987.
- Marsh, C.P. : **Man and Nature**, Harvard, 1967.
- C.S.E. **The State of India’s Environment – A Citizen’s Report**, Centre for Science and Environment, New Delhi, 1982.
- C.S.E. : **The State of India’s Environment – The 2nd Citizen’s Report**, Centre for Science and Environment, New Delhi, 1984.
- Dasman, R.F.: **Environmental Conservation**, John Wiley & Sons, New York, 1972.
- Detwyler J.R.: **Man’s Impact on Environment**, John Wiley & Sons, New York, 1975.
- Odun, E.P. : **Fundamentals of Ecology**, Prentice Hall Duffey,
E.: **Conservation of Nature**, Collins., London, 1970.
- Edington, J.M. and Edington, M.A.: **Ecology and Environmental Planning**, Chapman and Hall, London, 1977.
- Harvey, B. and Hallet, J.D.: **Environment and Society: An Introductory Analysis**, Macmillan, London, 1977.
- Hewitt, K & Hare, F.K. : **Man and Environment : A Conceptual Frame Work**, Commission on College Geography Resource, Paper 20, 1973; (AAG).
- Park C.C. : **Ecology and Environmental Management**, Butterworths, London, 1980.
- Sherlock, R.L. : **Man as a Geological Agent**, Witherby, London, 1922.
- Thomas, W.L. (ed.): **Man’s Role in Changing the Face of the Earth**. University of Chicago Press, Chicago, 1956.
- Kormondy, E.J. : **Concept of Ecology**, Prentice Hall, 1989
- Smith, R.L.: **Man and his Environment: An Ecosystem Approach**, Harper & Row, London, 1992
- Singh, S.: **Environmental Geography**, Prayag publication, Allahabad, 1991

GG-425(P): i) Population Mapping
ii) Climatology Practical

Course Content

- i) Measures of Population Change: Absolute and Percentage; Linear Growth Rate, Geometric Growth Rate and Exponential Growth Rate. Population Composition: Age-Sex Pyramid, Dependency Ratio, and Median Age.

- ii.) Basic Demographic Equation. Measures of Fertility: Total Fertility Rate (TFR), Gross Reproduction Rate (GRR) and Net Reproduction Rate (NRR). Construction of Abridged Life Table. Measuring Internal Migration: Intercensal Migration, and Indirect Measures of Net Migration. Population Projection.
- ii) Climatology practical
Exercises on: Climate normal calculation, Hythergraph, Climograph, Determination of climatic types from climatic data, Temperature anomaly, Trend : parametric (linear) and non-parametric (Mann-Kendall technique,) and dispersion calculations; Variability of rainfall; Rainfall dispersion graph and Rainfall anomaly Index.

Suggested Readings

- Srinivasan. K., **Training Manual on Demographic Techniques**. ORGI&UNFPA. 2014.
- Siegel, J.S. & Swanson, D.A., **The Methods and Materials of Demography**. Elsevier Academic Pres, California, 2004.
- Preston, S., Heuveline, P. & Guillot, M., **Demography: Measuring and Modeling Population Processes**, Blackwell, 2000
- Srinivasan, K. **Basic Demographic Techniques and Applications**. SAGE, India, 1997.
- Gates, E.S., **Meteorology and Climatology**, Harrap, London, 1972
- Hammond, R. & Mc Cullagh, P., **Quantitative Techniques in Geography**, Clarendon Press, Oxford, 1965.
- Horn, L.H., **An Introduction to Climate**, Mc Graw Hill Book Company, New Delhi, 1980.
- Mishra, R.P., **Fundamentals of Cartography**, Prasaranga, University of Mysore, 1969.
- Monkhouse, F.J. & Wilkinson, H.R., **Maps and Diagrams**, Methuen and Co., Ltd, 1971.
- Singh, R.L., **Elements of Practical Geography**, Students Friends,, Allahabad, 1968.
- Singh, R.N. & Kanauja, L.R.S., **Mapwork and Practical Geography**, Central Book Depot, Allahabad, 1963.
- Trewartha, G.T. & Horn, L.H., **An Introduction to Climate**, Mc Graw Hill Book Company, New Delhi, 1980.

GG-426(P) :Research Methodology and
Field Work- Survey Report (Physical)

i. **Research Methodology**

Planning a geographic research project, Types of data, Methods of data collection, Methods of field work .

Preparation of questionnaire; sampling, techniques for primary data collection; data processing, representation, Analysis and interpretation of data, methods of references and bibliography

ii. Field work –survey report.

Field Survey Report – In consultation with their guide/teacher, the students will conduct a detailed field work to prepare a field report or project report on the basis of collected data and information for their examination. The survey should be based on the observation, measurement and collection of data. The field report should be prepared with quantitative techniques and meaningful analysis.

Suggested Readings:

Ackoff, R.L., **The Design of Social Research**, University of Chicago Press, Chicago, 1961.

Kothari, C.R., **Research Methodology: Methods and Techniques**, 2nd edition, Wiley Eastern Ltd., New Delhi, 1993.

Miller, D.C., **Hand book of Research Design and Social Management**, 3rd. Edition, David McKay Company. Inc. New York, 1977.

Mishra, R.P. **Research Methodology: A Hand Book**, Concept Publishing Company, New Delhi, 1981.

Mishra, H.N. & Singh, V.P., **Research Methodology in Geography**, Concept Publishing Company, New Delhi, 1998.

Selltiz, C. et al : **Research Methods in Social Relations**, Rinehart and Winston, Inc., New York, 1959

Sharma, B.A.N. et. al. **Research Methods in Social Sciences**, Sterling Publishers, New Delhi, 1983.

N.B. The objective of the field work is to conduct survey of a selected region/area and study micro geomorphic features, weather elements, local environment, pattern of land use, human life, etc.

**Third Semester
Core Course**

Paper GG-531: Hydrology

- Unit I: Hydrological cycle, distribution of earth's water, water balance concept and its quantitative explanation; Human interference in the hydrological cycle.
- Unit II: Surface water hydrology: Precipitation, evaporation run-off infiltration, surface run-off, urban flooding; Drainage basin characteristics : drainage basin/watershed; measurement of water discharge, morphometric analysis.
- Unit III: Ground water – Recharge and discharge of ground water occurrence and types, hydraulic conductivity, fluctuation of groundwater, quality of water.
- Unit IV: Application of remote sensing in hydrological studies, water pollution watershed management, conservation of water resources, uses and demands

Suggested Readings:

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

Paper GG-532 : Regional Development and Planning

Course content

- Unit I: Concept of region, regional development and planning, Approaches to regional Development and planning, Geography and its role in regional development and planning.

- Unit II: Concept of Development: – its social, economic, environment, and cultural dimensions, Indicators of development, Resource base development, regional disparities in development.
- Unit III: Economic and planning regions, Methods of regionalization; Theories of regional development – Central place theory, Growth pole theory and Growth centre strategy, Economic Base Theory, Decentralization of planning.
- Unit IV: Regional development strategy of India – India’s five year plans, Integrated area development approach, micro-level planning and multi-level planning in India. Regional planning for tribal, agricultural, industrial and urban development, River basin planning, Damodar valley region, Metropolitan planning and Loktak Development Authority.

Suggested Readings:

- Albert, R. et. al. : **Spatial Organization : The Geographer’s View of the world**, Prentice Hall, N.J., 1971
- Banerjee, A. and Kar. B.: **Economic Planning and Development of North Eastern States**, Kanishka Publications, New Delhi, 1999.
- Bhat, L.S. et. al.: **Micro-level Planning: A Case Study of Karnal Area, Haryana**, Concept Publishing Co., New Delhi, 1976
- Chorley, R.J. & Hagget, R.: **Models in Geography**, Methuen, London, 1967
- Christaller, W.: **Central Places in Southern Germany**, Prentice Hall, Englewood, Cliffs, New Jersey, 1966
- Deb, B.J.: **Regional Development in North East India**, Reliance Publications, New Delhi, 1995
- Freeman, T.W. : **Geography and Planning**.
- Friedman, J. & Alonso, W. : **Regional Development and Planning – A Reader**, MIT Press, Cambridge, 1969
- Friedman, J.: **Utilization, Planning and National Development**, Bererly Hills, Sage Publications, 1973
- Glasson, J.: **An Introduction to Regional Planning**, Hutchinson Educational Ltd., London, 1974
- Glikson, A. : **Regional Planning and Development**.
- Guha, P. and Sdasyuk, G.: **Economic Regionalisation of India**, Census of India, 1961, Monograph, No.7, 1968
- Hilhorst, J.G.M. and Dunharm, D.M.: **Issues in Regional Planning**, Institute of Social Studies, The Hague, 1971
- Kuklinski, A.R.(ed) : **Growth Poles and Growth Centres in Regional Development**, Mouton, The Hague, 1972
- Mahesh Chand & Puri, V.K. : **Regional Planning in India**.
- Misra, R.P.(ed) : **Regional Planning : Concepts, Techniques, Policies and Case Studies**, Concept Publications, New Delhi, 1992

- Misra, R.P. et. al. : **Multilevel Planning**, Heritage, Delhi, 1980
- Mohapatra, A.C. and Rootray, J.K. : **Regional Development and Planning**, Rawat, Jaipur, 1998
- Mukherjee, A.: **Methodology and Database for Decentralised Planning**, Heritage, New Delhi, 1991
- Nair, K.R.S: **Regional Experience in a Developing Economy**, Wiley Eastern, New Delhi, 1982
- Raza, M.(ed): **Regional Development**, Heritage, Delhi, 1988.
- Sen, L.K. (ed.) : **Reading in Micro-level Planning & Rural Growth Centres**, NICD, Hyderabad, 1972
- Sundaram, K.V.(ed.) : **Geography and Planning**.

Third Semester
Elective Course
 Paper GG-533 : Photogrammetry

Course content

- Unit I: Introduction and Definitions; Aerial camera lens aerial film negatives and types of aerial photographs; Geometry of aerial photographs; scale of photographs; Image displacement of aerial photographs; Measurement of height differences from aerial photographs, Parallax formula, Control for mapping from photographs
- Unit II: Basic information and specifications for aerial photographs; Planning and execution of photographic flights; Completion of photographic task; Procurement, cost and security of aerial photography, Procedures for mapping of natural resources.
- Unit III: Photo/Image interpretation; Visibility of objects; Elements of Image/photo interpretation; Techniques of image interpretation; Interpretation of keys, The use of Multi-images in image interpretation.
- Unit IV: Application of aerial photo interpretation technique in geography: Land form analysis, Landuse analysis, Soil mapping; Geology aerial remote sensing in mineral exploration.

Suggested Readings:

- American Society of Photogrammetry: **Manual of Remote Sensing**, ASP, Falls Church, V.A. 1983.
- Barrett E.C. and L.F. Curtis: **Fundamentals of Remote Sensing and Air Photo Interpretation**, Mcmillan, New York, 1992.
- Colwell, R.N.: **Manual of Remote Sensing, vol.I & II**, American Society of Photogrammetry, 1983
- Compbell J.: **Introduction to Remote Sensing**, Guilford, New York, 1989.
- Curran, Paul J.: **Principles of Remote Sensing**, Longman, London, 1985.

- Gautam, N.C.: **Urban Landuse Study through Aerial Photo-interpretation Techniques**, Pink Publishing House, Mathura, 1970
- Hord R.M.: **Digital Image Processing of Remotely Sensed Data**, Academic, New York, 1989.
- Luder D.: **Aerial Photography Interpretation: Principles and Application**, McGraw Hill, New York, 1959.
- Pratt W.K. **Digital Image Processing**. Wiley, New York, 1978.
- Rao D.P. (eds.): **Remote Sensing for Earth Resources**, Association of Exploration Geophysicist. Hyderabad, 1998.
- Thomas M. Lillesand and Ralph W. Kefer, **Remote Sensing and Image Interpretation**, John Wiley & Sons, New York, 1994.

CBCS Course
Paper GG-534 : Agricultural Geography

Course content

- Unit I: Nature and scope of agricultural geography, Origin and dispersal of agriculture, Approaches to the study of agricultural geography.
- Unit II: Physical and non-physical factors of agricultural practices; Inputs of agriculture and environmental factors of agricultural production.
- Unit III: Agricultural systems of the world; Agricultural regionalization Methods. Agricultural efficiency, Carrying capacity of land, Regional imbalances in crop production and dietary deficiency.
- Unit IV: Agricultural regions of India, Green revolution, Land holding and land tenure system, Shifting cultivation in North-east India; Models of agricultural location; Principles of agricultural landuse planning, land capability classification.

Suggested readings (from page 113 of UGC model and old syllabus)

- Bayliss Smith, T.P.: **The Ecology of Agricultural Systems**. Cambridge University Press, London, 1987.
- Berry, B.J.L. et al.: **The Geography of Economic Systems**. Prentice Hall, New York, 1976.
- Brown, L.R.: **The Changing World Food Prospects – The Nineties and Beyond**. World Watch Institute, Washington D.C., 1990.
- Dyson, T.: **Population and Food – Global Trends and Future Prospects**, Routledge, London, 1996.
- Gobind, Nalini : **Regional Perspective and Agricultural Development**, Concept, Delhi, 1986

- Gregor, H.P. : **Geography of Agriculture**. Prentice Hall, New York, 1970.
- Grigg, D.B. : **The Agricultural Systems of the World**. Cambridge University Press, New York, 1974.
- Hartshorn, T.N. and Alexander, J.W. : **Economic Geography**, Prentice Hall, New Delhi, 1988.
- Hussain, M.: **Agricultural Geography**, Inter-India Publication, Delhi, 1979
- Mannion, A.M. : **Agriculture and Environment Change**. John Wiley, London, 1995.
- Morgan W.B. and Norton, R.J.C.: **Agricultural Geography**, Methuen, London, 1971.
- Morgan, W.B. : **Agriculture in the Third World – A Spatial Analysis**. Westview Press, Boulder, 1978.
- Sauer, C.O. : **Agricultural Origins and Dispersals**. M.I.T. Press, Mass, U.S.A., 1969.
- Singh, J. and Dhillon, S.S. : **Agricultural Geography**, Tata McGraw Hill Pub., New Delhi, 1988.
- Shafi Mhd: **Agricultural Geography**, , 2008
- Symons, L.: **Agricultural Geography**, G. Bells and Sons, London, 1967
- Tarrant, J.R. : **Agricultural Geography**. Wiley, New York, 1974.
- Wheeler, K.E., A.M. Ladley and P.G. Leong : **Studies in Agricultural Geography**, Bland Educational, London, 1970

Core Course

Paper GG-535(P) : Spatial Analysis

Exercises on Gravity and potential models and their applications, distribution of Trade hinterland area of central places, Network analysis – detour index, road connectivity, alpha, beta and gamma indices and Distant–decay relationship.

Spatial distribution of crops and cropping pattern – crop combination, crop concentration, crop diversification, crop intensity, agricultural efficiency.

Distribution of settlements showing dot and pie diagrams. Density of settlement, Determination of spacing of settlement, Functional classification of towns, Nearest neighbour index; Rank-size relationship, Determination of settlement hierarchy.

Suggested Readings:

- Berry, B.J.L. & Marble, D.F.: **Spatial Analysis: A Reader in Statistical Geography**, Prentice Hall Inc., 1968.
- Chorley, R.J. & Haggett, P(eds.): **Models in Geography**, Methuen, London, 1967.
- Haggwett, P. & Mc Cullagh, P.: **Locational Analysis in Human Geography**, Arnold, London, 1965.
- Mahmood, Aslam : **Statistical Methods in Geographical Studies**, Rajesh publication, New Delhi, 1976.
- Monkhouse, F.J. & Wilkinson, H.R.: **Maps and Diagrams**, Methuen and Co. Ltd., 1971.
- Smith, D.M. : **Patterns in Human Geography**, Penguin Books, 1975.

Yeates, M.M. : **An Introduction to Quantitative Analysis in Human Geography**, Mc Graw Hill Inc. 1974.

Core Course

Paper GG-536(P) : i) Soil & Hydrological Analysis
ii) Survey: Dumpy level/ Theodolite/ Total station

Course content

- a) Drainage basin analysis – shape of the basin, Drainage density, Drainage frequency.
Measurement of discharge of stream at various points and explanation of the variation.
Determination of effective uniform of depth of precipitation using i) Arithmetical Mean,
ii) Isohytal and iii) Thiessen Method.
Plotting data on a graph and explanation of the relationship between discharge and rainfall.
Drawing of unit hydrograph with given data and interpretation of the graph.
Measurement of percentage of load carried by a stream i) by volume and ii) by weight.
Determination of coefficient of permeability and ii) hydraulic conductivity of a given sample of soil.
Grain size analysis load carried by stream; Density analysis of load carried by stream.
Hydraulic conductivity by lab. & field methods, Darcy's law.
Soil permeability measurement.
- b) Preparation of profiles and thematic maps (built-up areas, road network, land configuration, etc.) by using survey instruments.

Suggested Readings:

- Bruce and Clark: **Introduction to Hydrometeorology**, Pergamon Press, London, 1959
De Wiest, R.J.M.: **Geohydrology**, John Wiley, 1965
Gondie, A. et al: **Geomorphological Techniques**, Union Hyman, London, 1990.
Karanth, K.R.: **Groundwater Assessment : Development and Management**, Tata McGraw Hill, New Delhi, 1987
Raghunath, H.M.: **Hydrology**, Wiley Eastern, Ltd. New Delhi, 1985
Rao, K.L.: **India's Water Wealth**, Orient Longman, New Delhi, 1979
Reddi, R.J.: **The Textbook of Hydrology**, Laxmi Publishers, New Delhi, 1999
Singh, R.A. and Singh, S.R.: **Water Management: Principles and Practices**, Tara publications, Varanasi, 1979
Smith, K.: **Water in Britain: A Study in Applied Hydrology and Resource Geology**, Mc Millan, London, 1972
Tebbut, T.H.Y.(ed) : **Advances in Water Engineering**, Elsevier Applied Science publication, London, 1985
Thonhwaite and Mather : **The Water Balance**, Publication in Climatology, vol.viii, No.I. 1955.

Fourth Semester

Core Course

Paper GG-541: Political Geography

Course content

Unit I: Nature, Scope and Content of Political Geography. Approaches to the Study of Political Geography: Hartshorne's Functional Approach; Jones' Unified Field Theory; and Wallerstein's World-Systems Theory. Political geography in the era of Globalisation.

Unit II: Concepts of Political Geography: State, Nation and Nation-State; Territory, Territoriality and Sovereignty; core and periphery concepts; Frontiers and Boundaries; Enclaves and Exclaves. Location, Shape and Size of State: Buffer States and Land Locked States; Strait, chokepoints. Forms of Governance: Colonialism, Decolonization, Neocolonialism, and Federalism. Significance of Political and Economic Blocs.

Unit III: Concepts of Geo-politics: Ratzel's Organic Concept of State. Critical Geopolitics. Geo-strategic Views: Mahan's Sea Power Theory; Mackinder's Geographical Pivot and Heartland Theory; Spykman's Rim Land Theory. Geo-politics in South-East Asia. Geopolitical Significance of Indian Ocean Region.

Unit IV: Electoral Geography: Approaches to Study of Electoral Geography; Geographic Influences on Voting Pattern; Electoral Abuse, Malapportionment, and Gerrymandering. Boundary Dispute and Geo-Political Setting of India. National and International Water Disputes of India. Geopolitics of North-East India.

Suggested Readings:

De Blij, H. J., & Glassner, M., **Systematic Political Geography**. John Wiley, New York, 1968.

Sudepta, A., **Political Geography**. Rawat, 1997.

Dikshit, R. D., **Political Geography: A Contemporary Perspective**. Tata Mc Graw Hill, New Delhi, 1996.

Dikshit, R.D. **Political Geography**, New Delhi, 2004

Dikshit, R.D. **Political Geography, a Century of Progress**, New Delhi, 1999.

Taylor, P., **Political Geography**. Longman, London, 1985.

Hazarika, J., **Geopolitics of North-East India: Strategic Study**. Gyan Publishing House, New Delhi, 1996.

Taylor, P. J. & Flint, C., **Political Geography World-Economy, Nation-State and Locality**. Routledge, 2019.

Taylor, P., **Political Geography**, London, 1985.

Elective Course

GG-542: Satellite Remote Sensing & Geographical Information System

Unit I: Historical development of Remote Sensing as a technology, Physical bases of remote sensing: Electromagnetic energy, Energy interactions in the atmosphere and earth surface features, Sensor platforms, orbital characteristics, Sensor packages and satellite data distribution; Remote Sensing data forms and their interchange ability

Unit II: Numerical data processing: Image correction; Image enhancement; Principles of basic concepts of Thermal and micro wave sensing system; Image classification procedure: unsupervised and supervised method; Ground data and training set manipulation.

Unit III: Regionalization of terrain from remotely sensed data, Application of remote sensing in geological mapping, Landuse/landcover mapping, mapping of soils and landforms; Remote Sensing as a means of environmental conservation and resource management.

Unit IV: Remote Sensing and Geographic Information System; Components of GIS, Database structures; Data input and output; GIS in urban planning; Geological application of GIS.

Suggested Readings:

- American Society of Photogrammetry: **Manual of Remote Sensing**, ASP, Falls Church, V.A. 1983.
- Barrett E.C. and L.F. Curtis: **Fundamentals of Remote Sensing and Air Photo Interpretation**, Mcmillan, New York, 1992.
- Clarke, K.C., Parks, B.O., M.P. Crane (Ed): **Geographic Information Systems and Environmental Modelling**, Prentice Hall of India, New Delhi, 2002
- Compbell J.: **Introduction to Remote Sensing**, Guilford, New York, 1989.
- Curran, Paul J.: **Principles of Remote Sensing**, Longman, London, 1985.
- Fraser Taylor, D.R.: **Geographic Information Systems**, Pergamon Press, Oxford, 1991
- Hord R.M.: **Digital Image Processing of Remotely Sensed Data**, Academic, New York, 1989.
- Lillesand T.M. & R.W. Keifer: **Remote Sensing and Image Interpretation**, John Wiley & Sons, New York (Fourth Ed), 1999
- Luder D.: **Aerial Photography Interpretation: Principles and Application**, McGraw Hill, New York, 1959.
- Maquire D.J.M.F. Goodchild & D.W. Rhind(eds), **Geographic Information Systems: Principles and Application**, Taylor & Francis, Washington, 1991
- Peuquet D.J. and D.F. Marble, **Introductory Reading in Geographic Information Systems**, Taylor & Francis, Washington, 1990
- Pratt W.K. **Digital Image Processing**. Wiley, New York, 1978.

Rao D.P. (eds.): **Remote Sensing for Earth Resources**, Association of Exploration Geophysicist. Hyderabad, 1998.

Sabins, Floyd, F.: **Remote Sensing Principles and Interpretation (Third Ed)**, W.H. Freeman and Company, New York, 2000

Star J and J. Ester, **Geographic Information Systems: An Introduction**, Prentice Hall, Englewood Cliff, New Jersey, 1994

Thomas M. Lillesand and Ralph W. Kefer, **Remote Sensing and Image Interpretation**, John Wiley & Sons, New York, 1994.

Core Course

Paper GG-543 : Urban Geography

Course content

Unit I: Nature and scope of urban geography, approaches and recent trends, origin and growth of urban settlements during ancient and medieval and modern periods

Unit II: Classification of towns, urban functions, basic and non-basic functions, functional classification of urban settlements. urban economy, Urban morphology, city regions, umland, periphery, urban- rural contrast, urban-rural continuum.

Unit III: Urbanization, trends of urbanization in developed and developing countries; Process of urbanization, urban primacy, centralisation and decentralisation, urbanisation in the North-east India.

Unit IV: Urban issues: Urban poverty, slums, pollutions, solid waste, urban health, transportation, housing and urban infrastructure; Urban policy and planning: urban renewal, globalisation and urban planning in the third world countries.

Suggested Readings

Alam, S.M.: **Hyderabad – Secunderabad Twin Cities**, Asia Publishing House, Bombay, 1964.

Berry, B.J.L. and Horton F.F. **Geographic Perspectives on Urban Systems**. Prentice Hall, Englewood Cliffs, New Jersey, 1970.

Carter: **The Study of Urban Geography**, Edward Arnold Publishers, London, 1972.

Chorley, R.J.O., Haggett P. (ed.): **Models in Geography**, Methuen, London, 1966.

Dickinson, R.E.: **City and Region**, Routledge, London, 1964.

Dickinson, R.E.: **West European City**, London, 1952

Dwyer, D.J. (ed.): **The City as a Centre of Change in Asia**, University of Hong Kong Press, Hongkong, 1971.

Garnier, J.B. and Chabot, G.: **Urban Geography**, Longman, 1967

- Gibbs J.P.: **Urban Research Methods**, D.Van Nostrand Co. Inc. Princeton, New Jersey, 1961.
- Hall P.: **Urban and Regional Planning**, Routledge, London, 1992.
- Hauser, Phillip M. and Schnore Leo F. (ed.): **The Study of Urbanisation**, Wiley, New York, 1965.
- James, P.E. and Jones C.F. (eds.): **American Geography, Inventory and Prospect**, Syracuse University Press, Syracuse, 1954.
- Kundu, A.: **Urban Development and Urban Research in India**, Khanna Publication, 1992.
- Meyor, H.M. Kohn C.F. (eds.): **Readings in Urban Geography**, University of Chicago Press, Chicago, 1955.
- Mumford, L.: **Culture of Cities**, McMillan & Co., London, 1958.
- Nangia, Sudesh: **Delhi Metropolitan Region: A study in settlement geography**, Rajesh Publication, 1976.
- Rao V.L.S.P. : **Urbanisation in India: Spatial Dimensions**. Concept Publishing Co., New Delhi Concept, New Delhi.
- Rao V.L.S.P.: **The Structure of an Indian Metropolis: A Study of Bangalore**, Allied Publishers Bangalore, 1979.
- Singh K. and Steinberg F. (eds.): **Urban India in Crisis**, New Age Interns, New Delhi, 1998.
- Singh, R.L.: **Banaras : A Study in Urban Geography**, Banaras, 1955 Smiles A.E.: **The Geography of Towns**, Hutchinson, London, 1953.
- Taylor, G.: **Urban Geography**, Methuen, 1951
- Tewari, Vinod K., Jay A. Weinstein, VLSPrakasa Rao (editors): **Indian Cities: Ecological Perspectives**, Concept, 1986.

CBCS Course

Paper GG-544 : Rural Settlement Geography

Course content

- Unit I: Nature and scope settlement geography. Approaches to rural settlement geography ; human settlement as a system. Histogenesis of rural settlements: spatio-temporal dimensions and sequent occupance.
Distribution of Rural settlements: size and spacing of rural settlements.
- Unit II: Types, forms and Patterns of rural settlements: cause and effect; Functional classification of rural settlements; Central places and rural service centres: their nature, hierarchy and functions
- Unit III: Social issues in rural settlements: poverty, housing and shelter, deprivation and inequality, Rural-urban interaction. Environmental issues in rural settlements: access to environmental infrastructure: water supply, sanitation, drainage, occupational health hazards.

Unit IV: Cultural landscape elements in rural settlements in different geographical environments with special reference to India: House types and field patterns Origin, evolution, size, socio-spatial structure of Indian villages.

Suggested Readings

- Alam, S.M. et al. **P Settlement System of India**, Oxford and IBH 2. Publication Co, New Delhi, 1982.
- Brook, J.O.M. and Welb, J.W.: **Geography of Mankind**, McGraw Hill, London, 1978.
- Chisholm, M.: **Rural Settlements and Land Use**, John Wiley, New York, 1967.
- Clout, H.D.: **Rural Geography**, Permagon, Oxford, 1977.
- Daniel, P. and Hopkinson, M.: **The Geography of Settlement**, Oliver & Byod, Edinburgh, 1986.
- Grover, N.: **Rural Settlements – A Cultural Geographical Analysis**, Inter-India Publication, Delhi, 1985.
- Hudson, F.S.: **A Geography of Settlements**, MacDonald & Evans., New York, 1976.
- Mitra, A.: **Report on House Types and Village Settlement Patterns in India**. Publication Development, Govt. of India, Delhi, 1960.
- Ramchandran, H.: **Village Clusters and Rural Development**, Concept Publication, New Delhi, 1985.
- Rao, E.N.: **Strategy for Integrated Rural Development**, B.R. Publication Cor., Delhi, 1986.
- Rappoport, A.: **House Form and Culture**, Prentice Hall, New Jersey, 1969.
- Sharma, R.C.: **Settlement Geography of an Indian Desert**, K.B. Publications, 1972
- Sen, L.K. (ed.): **Readings in Micro-Level Planning and Rural Growth Centres**, National Institute of Community Development, Hyderabad, 1972.
- Singh, R.L. and Singh, K.N. (eds): **Readings in Rural Settlement Geography**, B.H.U., Baranasi
- Singh, R.Y.: **Geography of Settlements**, Rawat, Jaipur, 1998
- Srinivas, M.N.: **Village India**, Asia Publication House, Bombay, 1968.
- Wanmali, S.: **Service Centres in Rural India**, B.R. Publication Cor., New Delhi, 1983.
- Uelko, M.J. et al: **Man, Settlement and Urbanisation**, Duckworth, 1972

Core Course
Paper GG-545(P) : Remote Sensing and Photogrammetry

Course content

Stereo test and study of different types of aerial photos, Orientation of stereo-model under mirror stereoscope and analysis of aerial photographs, Preparation of base map; Determinant of photo-scale, Determination of heights and slopes, Preparation of drainage and geomorphological maps from aerial photographs, preparation of forest and landuse/landcover mapping from aerial photographs.

Visual interpretation of satellite data for landuse and forest mapping, Visual interpretation of satellite data for geomorphological and drainage mapping for watershed analysis, Study of image processing system, Display of raw data, Histogram analysis, Enhancement of data classification.

Suggested Readings:

American Society of Photogrammetry : **Manual of Photographic Interpretation**, Banta Publishing Co., Menasha, Wisconsin, 1960

Anderson, J.R. et al: **A Landuse/Landcover Classification System for Uses with Remote Sensing Data**, USGS – Professional Paper, 1976

Avery, T.E. : **Interpretation of Aerial Photographs**, Burgess Publishing Co., Minnupolis, 1963

Barrett, E.C. & Curtis, L.F.: **Introduction to Environmental Remote Sensing**, Champman Hill, London, 1976

Estes, J.E. & Senger, L.W. : **Remote Sensing Techniques for Environmental Analysis**. Killford, W.K.: **Elementary Air Survey**, Pitman, London, 1963

Latman, L.H. & Ray, R.G. : **Aerial Photographs in Field Geology**.

Lo, C.P.: **Geographical Applications of Aerial Photography**, David and Charles (pub) Ltd., North Vancarver, 1976

Luder, D. : **Aerial Photographic Interpretation : Principles and Application**, Mc Graw Hill, New York, 1959

Nag, P.(ed): **Thematic Cartography and Remote Sensing**, Concept publishing Co., New Delhi, 1992

Narayan, L.R.A.: **Remote Sensing and its Applications**, University press (India) Ltd., Hyderabad, 1999

Pandey, S.N. : **Principles and Applications of Photogeology**.

Patel, A.N. and Singh, S.: **Principles of Remote Sensing**, Scientific Publishers, Jodhpur. Reevas, R.G. : **Manual of Remote Sensing vol.I & II**.

Smith, H.T.V.: **Aerial Photographs and their application**.

Spurr, S.H. : **Photogrammetry and Photo Interpretation**.

Tomar, M.S. & Maslekar, A.R.: **Aerial Photographs in Landuse and Forest Surveys**. U.S.Dept.of Interior/**Geological Survey: Studying the Earth from Space**.

Wolf, P.R. : **Elements of Photogrammetry**, Mc Graw Hill, New York, 1974

Core Course
Paper GG-546(P) : GIS and Field Work (Socio-economic)

Course content

i. GIS

Introduction to GIS Software, Data import (scanned maps, satellite images, and other sources), point map generation, Geo-referencing(direct and image to image); Data Input – On screen Digitization – Creation of Point, Line and Polygon layers; Spatial Data Analysis; Preparation of Non-Spatial Data, Linking Spatial and Non-Spatial data, Attribute data input and Measurement of Distance, Area, Map compilation and Design, layout

Data Conversion – Vector to Raster and Raster to Vector, Spatial and Non spatial Query and Analysis

Vector operations - Overlay analysis, Clip, Erase, Identity, Union, Intersection; Proximity Analysis: Buffering; Summary Statistics, Calculation of Area, Perimeter and distance; Raster Data Exploration: Query Analysis - Local operations; Reclassification, Logical operations, Filtering, Statistical Operations; Case study/Application based assignment

ii. Field Work (Socio-Economic)

In consultation with their guide/teacher, the students will conduct a detailed survey of a selected area/village/block to prepare a field report or project report for their examination. The survey should base on prepared schedule questionnaire. The field report should be prepared with quantitative techniques and meaningful analysis.

NOTE :The practical papers including field report of MA/MSc.final geography shall be examined by the internal and external examiners.

Suggested Readings:

Anderson, J. et.al. : **Thesis and Assignment Writing.**

Archer, J.E. & Dalton, T.H. : **Field Work in Geography.**

Elhance, D.N. : **Fundamentals of Statistics**, Kitab Mahal, Allahabad, 1972

Garnett, A.: **Geographical Interpretation of Topographical Maps**, Harrapa and Co., London, 1945

Hammond, R. & Mc Cullagh, P., **Quantitative Techniques in Geography**, Clarendon Press, Oxford, 1965.

Hody Kess, A.G.: **Maps for Books and Theses**, David and Charles, New York, 1970

Johnes, T.A. : **Field Work in Geography.**

Kothari, C.R.: **Research Methodology**, Wishva Prakashan, New Delhi, 1975

Misra, G.K.: **Block Level Planning**

Mishra, R.P., **Fundamentals of Cartography**, Prasaranga, University of Mysore, 1969.

Monkhouse, F.J. & Wilkinson, H.R., **Maps and Diagrams**, Methuen and Co., Ltd, 1971.

Sharma, B.A.V.et.al.: **Research Methods in Social Sciences.**

Sinha, B.N.: **Sirsi – An Urban Study in Application of Research Models**. Singh, R.L., **Elements of Practical Geography**, Students Friends, Allahabad, 1968 Stoddart, R.H.: **Field Techniques and Research Methods in Geography**, Kundall Hunt Publication, Dubuque, 1982.