COOCH BEHAR PANCHANAN BARMA UNIVERSITY

SYLLABUS FOR GEOGRAPHY (Under CBCS)

2021

Curriculum

First Semester

Course no.	Name of Course		Marks			Credit
		ESE	CE	A	Total	
C-1	Geomorphology and Oceanography	75	20 (Class Test)	5	100	5
C-2	Climatology and Biogeography	75	20 (Seminar)	5	100	5
C-3	Population and Settlement Geography	75	20 (Seminar)	5	100	5
C-4	General Practical	75	(10+10) Practical Laboratory Book and Viva	5	100	5

Second Semester

Course no.	Name of Course		Marks			Credit
		ESE	CE	A	Total	
C-5	Geographical Thoughts & Methods	75	20 (Class Test)	5	100	5
C-6	Economic and Transport Geography	75	20 (Class Test)	5	100	5
C-7	Agricultural and Industrial Geography	75	20 (Class Test)	5	100	5
C-8	Quantitative Methods in Geography	75	20 (Preparation of Field Report using Quantitative Methods) 10+ Viva 10	5	100	5

Third Semester

Course no.	Name of Course		Marks			Credit
		ESE	CE	A	Total	
C-9	Geography of India and West Bengal	75	20 (Study Tour Report)	5	100	5
C-10	Remote Sensing and GIS (Practical)	75	(10+10) Practical Laboratory Book and Viva	5	100	5
DCE-I	1.A) Fluvial Geography 1.B) Urban Geography 1.C) Cartography *(Any one from the above to be chosen)*	75	20 (Article Review)	5	100	5
GE-I	Social, Cultural and Political Geography	75	20 (Class Test)	5	100	5

Fourth Semester

Course no.	Name of Course		Marks			Credit
		ESE	CE	A	Total	
DCE-2	2.A) Fluvial Geography 2. B) Urban Geography 2.C)) Cartography *(Any one from the above to be chosen)*	75	20 (Class Test)	5	100	5
DCE-3	3.A) Fluvial Geography (Practical) 3. B) Urban Geography (Practical) 3.C) Cartography (Practical) *(Any one from the above to be chosen)*	75	(10+10) Practical Laboratory Book and Viva	5	100	5
DCE-4	4.A) Fluvial Geography (Dissertation) 4. B) Urban Geography (Dissertation) 4.C) Cartography (Dissertation) *(Any one from the above to be chosen)*	75	20 (Viva Voce)	5	100	5
GE-2	Geographical Issues and Research Methodology *(Any one from the above to be chosen)*	75	20 (Class Test)	5	100	5

ESE: End of Semester Examination; CE: Continuing Evaluation; A: Attendance

SEMESTER – I

Course No. – C-1

Course Name: GEOMORPHOLOGY & OCEANOGRAPHY

GEOMORPHOLOGY

Unit–I: Nature and scope of geomorphology: Fundamental concepts, systems in geomorphology; Geo-chronological methods: Concept of dating, Relative and absolute dating – principles and techniques; Geological time scale and major events on earth surface.

Unit-II: Periglacial process and landforms; Hill slope forms and processes: Mass movements – causing factors, classification and remedial conservative measures; Slope: Evolution, forms, parallel retreat and slope replacement models.

OCEANOGRAPHY

Unit–I: Nature and scope of oceanography; History of oceanographic expedition; Ocean bottom relief: Indian, Pacific and Atlantic Oceans; Ocean deposits; Coral reefs; UNCLOS.

Unit–II: Temperature and salinity of the oceans; Density of sea water; Tides and ocean currents; Sea-level changes; Exclusive economic zone; Food and mineral resources of the sea; India's off-shore wealth.

References: GEOMORPHOLOGY

1. Ahnert, Frank, 1998: Introduction to Geomorphology, Arnold Publishers Ltd., London, UK, First Edition.
2. Alt, David, 1982: Physical Geology: Approach, Wardsworth Publishing Company, California, USA, First Edition.
3. Bartholomed, Rolland B. and Tillery, Bill W., 1984: Earth Science, D.C. Heath & Co., Lexinton, USA, First Edition.
4. Bradshaw, M.J., Abbott, A.J. and Gelsthorpe, A.P., 1978: The Earth's Changing surface, Hodder & Stoughton, London, UK, First Edition.
5. Butzer, Karl W., 1976: Geomorphology from the Earth, Harper and Row, Publishers, New York, USA, First Edition.
6. Chorely, R.J. & Kennedy, 1971; Physical Geography: A systems approach, Prentice Hall.
7. Chorley, Richard J., Schumm, Stanley, A. and Sugden, David E., 1985: Geomorphology, Methuen & Company, New York, USA, First Edition.
8. Cooke, R.U. and Doornkamp, J.C., 1997: Geomorphology in environmental management: A new introduction, Oxford University Press, New York, Second Edition.

9. Davis, Stanley N., Reitan, Paul H. and Pestrong, Raymond, 1976: Geology: Our Physical Environment, McGraw-Hill Book Company, New York, USA, First Edition.
10. Derbyshire, E., Gregory, K.J. and Hails J.R., 1979: Geomorphological Processes: Studies in Physical Geography, Butterworths, London, UK, First Edition.
11. Embleton, Clifford and Thornes, John, (Ed.), 1980: Processes in Geomorphology, Arnold-Heineman Publishers (India) Pvt. Ltd., New Delhi, First Indian Edition.
12. Flint, Richard Foster and Skinner, Brian J., 1977: Physical Geology, John Wiley & Sons, New York, USA, Second Edition.
13. Gabler, Robert E., Brazier, Sheila, Sagar, Robert J. and Wise, Daniel L., 1982: Essentials of Physical Geography, Saunders College publishing, New York, USA, Second Edition.
14. Garner, H.F., 1974: The origin of Landscapes: A Synthesis of Geomorphology, Oxford University Press, Inc., New York, USA, First Edition.
15. Gerrard, A.J., 1988: Rocks and Landforms, Unwin Hayman, London, UK, First Edition.
16. Gilluly, James, Waters, Arron C. and Woodford, A.O., 1968: Principles of Geology, W.H. Freeman and Company, London & Toppan Company, Ltd., Tokyo, Japan, Third Edition.
17. Holmes, Arthur, 1965: Principles of Physical Geology, First ELBS and Nelson Edition, London, UK, Second Edition.
18. Kale, Vishwas S. and Gupta, Avijit, 2001: Introduction to Geomorphology, Orient Longmen, Calcutta, First Edition.
19. King, Lester C., 1967: The morphology of the earth: A study and synthesis of world scenary, Oliver and Boyd, Edinburg, UK, Second Edition.
20. Larousse, 1961: Encyclopedia of the Earth, Prometheus Press, New York, USA, Batchworth Press, Ltd.
21. Rice, R.J., 1977: Fundamentals of Geomorphology, Longman Group Ltd., London, UK, First Edition.
22. Selby, M.J., 1993: Hillslope materials and processes, Oxford University Press, Oxford, Second Edition.
23. Small, R. J., 1978: The study of Landforms: A Textbook of Geomorphology, Cambridge University Press, Cambridge, UK, Second Edition.
24. Strahler, Arthur N., 1960: Physical Geography, John Wiley & Sons, Inc., New York, USA, Second Edition.
25. Strahler, Arthur N., 1963: The Earth Sciences, Harper's Geoscience Series, Harper & Row, Publishers, New York, USA, First Edition.
26. Trinkler, K.J., 1989: History of Geomorphology: From Hutton to Hack, Unwin Hayman, Winchester, USA, First Edition.
27. Worcester, Philip G., 1948: A Textbook of Geomorphology, D. Von Nostrand Co., Inc., New York, USA, Second Edition.

Reference: OCEANOGRAPHY

1. Ahmed, E., 1972: Coastal Geomorphology of India, Orient Longman Limited, New Delhi, India, First Edition.

2. Bose, A.N., Dwivedi, S.N., Danda, Ajit K., Mukhopadhyay, Dilip and Bandyopadhyay, K.K., (Ed.), 1989: Coast Zone Management of West Bengal, Sea Explorers' Institute, Calcutta.
3. Darke, Charles L., Imbrie, John, Knauss, John A. and Turekian, Karl K., 1978: Oceanography, Holt, Rinchart and Winston, New York, USA, First Edition.
4. Defant, Albert, 1961: Physical Oceanography, Pergamon Press, London, UK, First Edition, Volume – I.
5. Dietrich, Gunter, 1963: General Oceanography: an introduction, Translated by Feodor Ostapoff, Interscience Publishers, A division of John Wiley & Sons, New York, USA, First Edition.
6. Garrison, T., 2001: Oceanography-An Introduction to Marine Science, Books/Cole, Pacific Grove, USA.
7. Gross, M. Grant, 1987: Oceanography, a view of the Earth, Prentice–Hall Inc., New Jersey.
8. Guilcher, Andre, 1958: Coastal and Submarine Morphology, Methuen & Co. Ltd., London, UK, Translated by B.W. Sparks and Rev. RHW Kneese.
9. Idyll, C.P., 1978: The Sea against hunger: harvesting the oceans to feed hungry world, Apollo Editions, New York, USA, New updated Edition.
10. Keen, M. J., 1968: An introduction to Marine Geology, Pergamon Press, London, U.K., First Edition.
11. King, C.A.M., 1962: Oceanography for Geographers, Edward Arnold (Publishers) Ltd., London, UK, First Edition.
12. King, C.A.M., 1972: Beaches & Coasts, Edward Arnold (Publishers) Ltd., London, U.K., Second Edition.
13. Mero, John L., 1965: The mineral resources of the sea, Elsevier Oceanography Series, Elsevier Scientific Publishing Company, Amsterdam, The Netherlands, First Edition.
14. Neumann, Gerhard and Pierson, Jr. Willard J., 1966: Principles of Physical Oceanography, Prentice-Hall, Inc., New Jersey, USA, First Edition.
15. Sears, Dr. M., (Ed.), 1963: Progress in Oceanography, Pergamon Press Ltd., Great Britain, U.K., Vol. I.
16. Sharma, R.C. and Vatal, M., 1962: Oceanography for Geographers, Chaitanya Publishing House, Allahabad, India, First Edition.
17. Shepard, Francis P., 1973: Submarine Geology, Harper & Row, Publishers, New York, Third Edition.
18. Steers, J.A., (Ed.), 1971: Applied Coastal Geomorphology, Macmillan, Edinburgh, U.K., First Edition.
19. Sverdrup, H.U., Johnson, Martin W. and Fleming, Richard H., 1942: The Oceans: their physics, chemistry and general biology, Prentice-Hall, Inc., Tokyo, Japan, First Edition, First Printing (Modern Asia Edition), 1961.
20. Turekian, Karl K., 1968: Oceans, Foundations of Earth Science Series, Prentice-Hall, Inc. New Jersey, USA, First Edition.
21. Ummerkutty, A.N.P., 1985: Science of the Oceans and Human life, NBT, New Delhi.
22. Von Arx, William S., 1962: An introduction to Physical Oceanography, Addison-Wesley Publishing Company, Inc., USA.
23. Von, Arx, William S., 1962: An introduction to Physical Oceanography, Addison – Wesley Publishing Company, Inc.
24. Williams, W.W., 1960: Coastal Changes, Routledge & Kegan Paul, London, UK, First Edition.

25. Yasso, Warren E. 1965: Oceanography, A Study of Inner Space, Holt, Rinehart and Winston, Inc., N.Y., USA, First Edition.

Course No. –C-2

Course Name: CLIMATOLOGY & BIOGEOGRAPHY

CLIMATOLOGY

Unit–I: Composition and structure of the atmosphere; Insolation; Heat budget of the earth; Distribution of temperature; Atmospheric pressure and general circulation of winds: planetary and local winds; Monsoon and jet stream; Stability and instability of the atmosphere.

Unit–II: Air pressure; Air masses and frontogenesis; Temperate and tropical cyclones; Types and distribution of precipitation; Classification of world's climate: Koppen's, Thrornthwaite's and Trewartha's scheme; Climate change and global warming: evidences, probable causes and impact; Society's response to climate change.

BIOGEOGRAPHY

Unit–I: Physical factors influencing world distribution of plants and animals; Forms and functions of ecosystem; Forest, grassland, marine and mountain ecosystem; Bio-diversity and its depletion through natural and man induced causes; Conservation and management of ecosystem.

Unit–II: Genesis of soils; Soil profile; Classification and distribution of soils; Soil erosion; Soil degradation and conservation; Social forestry and agro-forestry; Wild Life; Major gene pool centers.

References: CLIMATOLOGY

1. Barry, R.G. and Chorley, R.G., Atmosphere, Weather and Climate, Methuen & Co., London, 1968.
2. Byers, H.R., General meteorology, Mcgraw Hill Book Co., New York, 1959.
3. Craig, R.A., The Upper Atmosphere – Meteorology and Physics, Academic Press, New York, 1965.
4. Critchfield, H.J., General Climatology, Prentice Hall of India Pvt. Ltd., New Delhi, 1975.
5. Crowe, P.R., Concepts in Climatology, Longmans, London, 1971.
6. Das, P.K., The Monsoons, N.B.T., New Delhi, 1970.
7. Flohn, H. (Ed.), General Climatology, Elseveir, Amsterdam, 1969.
8. Haurwitz, B. and Austin, J.M., Climatology, Mcgraw Hill Book Co., New York, 1944.
9. I.M.D., Monsoons of the World, I.M.D., New Delhi, 1960.
10. Kendrew, W.G., Climatology, Oxford University Press, 1957.

11. Landsberg, H., Physical Climatology, Gray Printing Inc. Du. Bois, Paris, 1958.
12. Mason, B.J., The Physics of Clouds, Oxford University Press, New York, 1970.
13. Petterssen, Sverre, Introduction to Meteorology, Mcgraw Hill Book Co., New York, 1958.
14. Rasool, S.I. (Ed.), Chemistry of the Lower Atmosphere, Plenum Press, New York, 1975.
15. Ratcliffe, J.A., (Ed.), Physics of the Atmosphere, Academic Press, New York & London, 1960.
16. Riehl, H., Jet Streams of the Atmosphere, Colorado University, Colorado, 1969.
17. Saha, P.K., & Bhattacharyya, P.K., Adhunik Jalavayu Vidya (Modern Climatology), West Bengal State Book Board, Calcutta, 1999.
18. Saha, P.K., El-Nino – La Nina/ENSO and its Impact on Global Climate in 'Contemporary Dimensions in Geography', University of Burdwan, Burdwan, 2000.
19. Saha, P.K., Nature and Natural Processes in 'Environment', Calcutta University, Calcutta, 2000.
20. Trewartha, G.T., An Introduction to climate, Mcgraw Hill Kogakusha, Ltd., Tokyo, 1968.

References: BIOGEOGRAPHY

1. Aaradhana, P.S., 1998: Himalayan Ecology, Rajat Publications, Delhi.
2. Brodie, Juliet, 1985: Grassland studies; Practical ecology series, George Allen & Unwin Publishers Ltd., London.
3. Brown, James H. and Gibson, Arthur C., 1983: Biogeography, The C.V. Mosby Co., St. Louis, USA.
4. Chapman, J. L. and Reiss, M. J. 1999: Ecology: Principles and Applications, Cambridge Low-Price Edition, Delhi, Second Edition.
5. Eyre, S.R., (Ed.) 1971: World Vegetation types, Macmillan, London.
6. Eyre, S.R., 1968: Vegetation and Soils; a world picture, Edward Arnold, London, Second Edition.
7. G. Tyler Miller, Jr., 1992: Living in the environment: an introduction to environmental science, Wadsworth, Inc., California, 7th Edition.
8. Gupta, R.K., Dabral, B.G., Homji, V.M. Meher and Puri, G.S., 2000: Forest Ecology; Environment, Forests and rainfall, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, Vol. 3.
9. Kellman, Martin C., 1975: Plant Geography, Methuen & Co. Ltd., London.
10. MacDonald, G.M., 2003: Biogeography; Introduction to Space, Time and Life. John Wiley and Sons Inc. USA.
11. Meyen, F.J.F., 1846: The Geography of Plants, Logos Press (1986), New Delhi.
12. Rao, R.R., 1994: Biodiversity in India; Floristic aspects, Doon Photographic Printers, Dehra Dun, India.
13. Robinson, H., 1972: Biogeography, ELBS, London, First Edition.
14. Silvertown, Jonathan W., 1982: Introduction to plant population ecology, Longman Group Ltd., England.
15. Strain, B.R. and Billings, W.D., (Ed.) 1974: Vegetation and Environment, Dr. W. Junk. b.v.- Publishers, The Hague.
16. Tivy, Joy and O'Hare, Greg, 1981: Human impact on the Ecosystem; conceptual framework in Geography, Oliver & Boyd, Edinburgh.

17. Waring, Richard H. and Running, Steven W., 1998: Forest Ecosystems; analysis at multiple scales, Academic Press, London, Second Edition.
18. Woodward, F.I., 1987: Climate and Plant distribution, Cambridge series in Ecology, Cambridge University Press, Cambridge.

Course No. – C-3

Course Name: POPULATION & SETTLEMENT GEOGRAPHY

POPULATION GEOGRAPHY

Unit–I: Nature and scope of population geography; Data sources; Population dynamics: Fertility, mortality and migration; Theories of population growth: Malthus, Marx, optimum Population and demographic transition; Migration theories: Ravenstien and Everetts Lee.

Unit–II: Population resource region; Human development index; India's population: Population distribution, density and growth; National population policy. UNO's World Population Plan of Action.

SETTLEMENT GEOGRAPHY

Unit–I: Site, situation, types, size and spacing of settlement and internal morphology of rural and urban settlements; Ecological processes of urban growth; Urban fringe; City-region; Settlement system; Primate city; Rank-size rule; Settlement hierarchy; Christaller's Central Place theory; August Losch's theory of Market Centers.

Unit–II: Urban settlement; Morphology of Indian cities; Functional classification of towns; Conurbation and metropolitan region; Urban sprawl; Slum and associated problems; town planning; Problems of urbanization in India and remedies.

References: POPULATION GEOGRAPHY

1. Berclay George W. – Techniques of Population analysis.
2. Bhattacharya A. – Human migration through the ages, The Calcutta Review, new Series, Vol. III, No. 1, 1977.
3. Bhattacharya A. – Population Geography of India.
4. Bilasborrow, Richard E and Daniel.Hogan, Population and Deforestation in the Humid Tropics, International Union for the Scientific Study of Population, Belgium, 1999.

5. Bogue, D, J., Principles in Demography, John Wiley, New York ,1969.
6. Bose, Ashish et.al.: Population in India's Development (1947-2000); Vikas Publishing House, New Delhi ,1974.
7. Census of India, India: A State Profile, 1991.
8. Chandna, R.C., Geography of Population: Concept, Determinants and Patterns, Kalyani Publishers, New York, 2000.
9. Clarke, John I., Population Geography, Pergamon Press, Oxford ,1973.
10. Crook, Nigel, Principles of Population and Development. Pergmon Press, New York, 1997.
11. Daugherty, Helen Gin, Kenneth C.W. Kammeyir, An Introduction to Population (Second Edition), The Guilford Press, New York, London, 1998.
12. Garnier, B.J., Geography of Population, Longman, London, 1970.
13. Jones Emrys - Metropolis.
14. Kanitkar Tara and Vende Asha – Studies in Population.
15. Kochhar, Rajesh, The Vedic People: Their History and Geography, Orient Longman Ltd., New Delhi, 2000.
16. Mamoria, C.B. India's Population Problem, Kitab Mahal, New Delhi, 1981.
17. Mitra, Asoka, India's Population; Aspects of Quality and Control. Vol. I & II, Abhinar Publications, New Delhi, 1978.
18. Smith, R.I. (Ed.) – The ecology of man.
19. Srinivasan, K. and M. Vlassoff., Population Development Nexus in India: Challenges for the New Millenium. Tata McGraw – Hill, New Delhi, 2001.
20. Srinivasan, K., Basic Demographic Techniques and Applications Sage publications, New Delhi 1998.
21. Sundaram K.V. and Sudesh Nangia, (ed.), Population Geography, Heritage, Publications, Delhi 1986.
22. The determinants and consequencs of population trends, Vol. I, United nations Publication, 1977.
23. UNDP: Human Development Report. Oxford University Press, Oxford 2000.
24. United Nations, Methods for Projections of Urban and Rural Populations, No. VIII, New York 1974.
25. Woods, R. Population Analysis in Geography. Longman, London 1979.
26. Zelinsky Wilbur, A prologue to Population Geography, Prentice Hall, 1966.

References: SETTLEMENT GEOGRAPHY

1. Ambrose, Peter, 1970: Concepts in Geography, Vol.-I, Settlement Pattern, Longman.
2. Baskin, C., (Translator) 1996: Central Places in Southern Germany, Prentice-Hall Inc. Englewood Cliffs New Jersey, Originally written by C.W. Christaller in German with title Dio Zentralen Orle Suddeutsch land in 1933.
3. Haggett, Peter, Andrew D. Cliff and Allen Frey (Ed.) 1979: Locational Models Arnold Heinemann.
4. King, Leslie, J., 1986: Central Place Theory, Saga Publications, New Delhi.
5. Mayer, M. Harold and Clyde F. Kohn (Ed.) 1967 Readings in urban Geography, Central Book Depot, Allahabad.
6. Mitra, Asok, Mukherjee S and Bose, R., 1980: Indian Cities Abhinav Publications, New Delhi.
7. Nangia, Sudesh, 1976: Delhi Metrpolitan Region, K.B. Publications, New Delhi.

8. Prakasa, Rao, V.L.S., 1992: Urbanisation in India: Spatial Dimensions, Concept Publishing Co., New Delhi.
9. Ramachandran, R., 1992: Urbanisation and Urban Systems in India, Oxford University Press, New Delhi.
10. Singh, R.L. and Kashi Nath Singh (Ed.) 1975: Readings in Rural Settlement Geography, National Geographical Society of India, Varanasi.
11. Ucko, M.J., Ruth Tringham and G.W. Dimbleby (editors) 1972: Man, Settlement and Urbanism, Duckworth.
12. United Nations Centre for Human Settlements (HABITAT) 1996: An Urbanising World, Global Report on Human Settlements, Oxford University Press for HABITAT.

Course No. – C4
Course Name: GENERAL PRACTICAL

Unit–I: Surveying

i. Contouring of an area with the help of Dumpy Level
ii. Theodolite Survey: Principles and application, Measurement of height of an object with the help of Theodolite when the base is inaccessible
iii. Total Station and GPS survey

Unit–II: Concepts, types, properties and uses of map projection

i) Simple Conical Projection with Two Standard Parallels
ii) Cylindrical Equal-Area Projection
iii) Polyconic Projection
iv) Polar Zenithal Gnomonic Projection
v) Universal Transverse Mercator (UTM)

Unit–III: Study of Topographical Maps

i. Principles of topographical map and numbering system
i) Drainage patterns; Basin demarcation, Morphometric analysis – Stream ordering (Strahler), basin circulatory and elongation ratio, drainage density and texture, relative relief and dissection index
ii) Altimetric and hypsometric curves
iii) Nearest neighbor analysis of settlements
iv) Interpretation of physical and cultural landscapes

References

1. Command of the Defence Council: Textbook of Topographic Surveying, Ministry of Defence, London, Fourth Edition, 1965.
2. Cromley, Robert G., 1997: Digital Cartography, Prentice Hall, Englewood Cliffs, New Jersey, First Edition.
3. Ebdon, David - Statistics in Geography: A Practical Approach, Basil Blackwell Publisher, Oxford, England, 1983.
4. Hinks, A.R.: Map Projections, Cambridge University Press, Cambridge, UK, First Edi., 1921.
5. Kellaway, George P.: Map Projections, Methuen & Co. Ltd., London, Second edi., 1949.
6. Krakk Menno-Jan and Brown Allan: Web Cartography: developments and prospects, Taylor & Francis, London, First Edition, 2001.
7. Mailing, D. H.; The Terminology of Map Projections, International year Book of Cartography VIII, George Philip & Sons Ltd., London, First Edition 1968.
8. Mainwaring, James: An Introduction to the study of Map Projection, Mc Millan & Co., NY 1960
9. Misra, R. P.; Fundamentals of Cartography, Concept Publishing Company, New Delhi, Revised & Enlarged Edition, 1989.
10. Rabinson, Arthur H., Morison, Joel L., Muehrcke, Philip C., Kimerling, A. Jon and Guptill, Stephen C.: Elements of Cartography, John Wiley & Sons, Inc., N.Y., Sixth Edition, 1995.
11. Raisz Erwin; Principles of Cartography, International Student Edition, McGraw-Hill Book Co. Inc., Tokyo, Japan, First Edition 1962.
12. Raisz, Erwin; General Cartography, McGraw Hill Book Co., New York, 1938.
13. Roy, P.; An Analytical Study of Map Projections, Applied and Mathematical Geographic Studies, Calcutta, First Edition, 1988.
14. Sarkar, Ashis; Practical Geography – A Systematic Approach, Orient Longman, Cal First Edition, 1991.
15. Sarkar, Ashis and Roy, P., 1983: Some selected Map Projection for India – their relative efficiencies, Geographical Review of India, Kolkata, Vol. 43, No. 2.
16. Singh, R. L.: Elements of Practical Geography, Kalyani Publishers, New Delhi, First Ed., 1979.
17. Snyder, John P.; Flattening the Earth-Two thousand years of Map Projections, The University of Chicago Press, Chicago, First Edition 1997.
18. Steers, J.A.: An introduction to the Study of Map Projections, University of London Press Ltd., London, Thirteenth Edi., 1962.
19. Stout, K.J. and Blunt, L., 1994: Three-Dimensional Surface Topography, Penton Press, London, First Edition.
20. Tobler, W. R.; Automation and Cartography, in Geographical Review of India, Calcutta, Vol. 49, No. 4.

SEMESTER – II

Course No. – C-5

Course Name: GEOGRAPHICAL THOUGHTS & METHODS

GEOGRAPHICAL THOUGHTS

Unit–I: General character of geographic knowledge during the ancient and medieval period; Foundations of modern geography; Contribution of German, French, British and American schools; Geography of inequality; Social well-being and welfare approach.

Unit–II: Paradigms shift; Man and Environment; determinism and possibilism; areal differentiation and spatial organization; Quantitative revolution, Role of positivism, humanism, radicalism and behaviouralism in geography.

METHODS

Unit–I: Ideographic and Nomethetic; Application of quantitative techniques; System Approach in Geography, Role of Map in Geographical Study

Unit–II: Mental map, Emergence of Emotional geography, Role of Laws, Theories, Simulation and Models in explanations in Geography, Emergence of Hybrid geography

References

1. Abler, Ronald; Adams, John S. Gould, Peter, 1971: Spatial Organization: The Geographer's View of the World, Prentice Hall, N.J.
2. Ali, S.M. 1966: The Geography of Puranas, Peoples Publishing House, Delhi.
3. Ambrose, P. Analytical Human Geography.
4. Amedeo, Douglas, 1971: An Introduction to Scientific Reasoning in Geography, John Wiley, U.S.A.
5. Annals of Association of American Geographers Vol.69. No.3, 1979.
6. Blunden, J., Hagget P., Hamnett C. & Sarre P. Ed., Fundamentals of Human Geography: A reader.
7. Brown, E.H. (Ed): Geography, yesterday and tomorrow.
8. Coffey, William J., Geography towards general spatial systems approach.
9. Cox, K.R. & Colledge R.C.: Behavioural problems in Geography revisited.
10. Cox, K.R.; Man; Location and Behaviour: An Introduction to Human Geography,
11. Dickinson, R.E.; The makers of modern Geography.
12. Dikshit, R.D. (Ed.) 1994: The Art & Science of Geography Integrated Readings, Prentice Hall of India, New Delhi.
13. Gould, J.R: An introduction to Behavioural Geography
14. Hagget, Peter; Locational analysis in Human Geography.

15. Hagget, Peter; Geography: A modern synthesis.
16. Hartshorne, R.; The Changing nature of Geography.
17. Hartshorne, R, 1959: Perspectives on Nature of Geography, Rand McNally & Co.
18. Harvey, David, Explanation in Geography
19. Husain, Majid; 1984: Evolution of Geographical Thought, Rawat Publications, Jaipur.
20. James, P.E.; All possible world: A history of Geographical Ideas.
21. Jensen, A.H.; Geography its history and concepts.
22. Johnston, R.J.; 1945: Geography and geographers: Anglo American Human Geography.
23. Johnston, R.J., 1983: Philosophy and Human Geography, Edward Arnold, London.
24. Johnston, R.J., 1988: The Future of Geography, Methuen, London.
25. Jones, Emrys, Human Geography.
26. Minshull, Roger, Regional Geography: Theory and Practice.
27. Minshull, Roger, 1970: The Changing Nature of Geography, Hutchinson University Library, London.
28. New Zealand Journal of Geography - No.61, Oct. 1976.
29. Peet, Richard, Radical Geography: Alternative view points on Contemporary Social issues.
30. Smith, D.M., Human Geography: A Welfare approach.
31. Smith, R.I. (Ed), The ecology of man.
32. Taylor, Griffith, Geography in the twentieth century.
33. The Calcutta Review – New Series, Vol. III, No.1, 1977.

Course No. – C-6

Course Name: ECONOMIC & TRANSPORT GEOGRAPHY

ECONOMIC GEOGRAPHY

Unit–I: Location of economic activities and spatial organisation of economies; Classification of economies; Sectors of economy: Primary, secondary, tertiary and quaternary; Natural resources: Renewable and non-renewable; Conservation of resources.

Unit–II: World economic development: Measurement and problems; Energy crisis; The limits to growth; World agriculture types and regions; Major industries (Aerospace, Fishing, Tourism, Steel, Healthcare, Fruit and Education) of the world – their location, pattern, problems and prospects.

TRANSPORT GEOGRAPHY

Unit–I: Nature and scope of transport geography; Geographic relevance of transportation; Transport and development: Conceptual frameworks; Models of global relevance: (i) The Vance model, (ii) The Rimmer model, and (iii) The Taaffe, Morril and Gould model.

Unit–II: The Modes of transport: Introduction to the modes of transport; Modal characteristics, Roads, Railways, Underground roads/railways, Pipelines, Ropeways and Cableways, Waterways and Airways and their role in regional development; Accessibility and connectivity; Comparative cost advantages, Development in communication and information technology and their impact on economy and society; Indian space programme

References

1. Berry J.L Geography of Market centers and Retail Distribution, Prentice Hall, New York, 1967.
2. Chatterjee, S.P.: Economic Geography of Asia, Allied Book Agency, Calcutta, 1984.
3. Chorley, R.J. and Haggett, P. (ed.): Network Analysis in Geography, Arnold, 1969.
4. Eckarsley, R. (ed.): Markets, the State and the Environment, Mc Millan, London, 1995.
5. Garnier. B.J. and Delobez, A Geography of Marketing, Longman, London, 1979.
6. Hurst E: Transport Geography-Comments and Readings, Mc Graw Hill, New York 1974.
7. Hurst Medical Ellot – The Geographic study of transportation.
8. Llyod P. L. & Dicken P. – Location in Space: A theoretical approach to economic Geography.
9. Losch , A., The Economics of Location, University Press, Yale, New Haven, 1954.
10. Mc Carty H. & Lindbery J.B. – Economic Geography.
11. Moryadas Lowa – The Geography of Movements.
12. Mulvilhill D. F. and Mulvihil R.C. – Geography, marketing and economic growth.
13. Rostow, W.W.: The Stages of Economic Growth, Cambridge University Press, London, 1960.
14. Royen W. V. and Bengtson N. A. – Fundamentals of Economic Geography.
15. Smith, D.M.: Industrial Location, John Wiley & Sons, N.Y., 1971.
16. Wheeler, J.O. et. al.: Economic geography, John Wiley, New York, 1995.
17. Bamford, C.G. and Robinson, H. (1978), Geography of Transport, Macdonald and Evans,London.
18. Bhaduri S. (1992), Transport and Regional Development, Concept Publishing Company,New Delhi.
19. Chorley, R.J. and Haggett, P. (1967), Modes in Geography, Methuen and Company, London.
20. Eliot Hurst, M.E. (1972), A Geography of Economic Behaviour: An Introduction, Duxbury Press, California.
21. Hammond, R. and Mc Cullagh, P.S. (1989), Quantitative Techniques in Geography; An Introduction, Clarendon Press, Oxford.
22. Hay, A. (1973), Transport Economy, Macmillan, London.
23. Hoyle, Band Knowles, R. (2000), Modern Transport Geography, John Wiley and Sons, New York.
24. Hoyle, B.S. (1973) Transport and Development, Macmillan, London.

Course No. – C-7

Course Name: AGRICULTURAL & INDUSTRIAL GEOGRAPHY

AGRICULTURAL GEOGRAPHY

Unit–I: Defining the field: Introduction, nature and scope, Land use/land cover classification and definition; Determinants of agriculture: Physical, technological and institutional.

Unit–II: Concept and techniques of delimitation of agricultural regions; Measurement of agricultural productivity; Crop combination and diversification; Von Thunen's model; Agriculture systems of the world; Problems of Indian agriculture.

INDUSTRIAL GEOGRAPHY

Unit–I: Evolution and classification of industries: Weber's and Losch's approaches; Resource based and footloose industries; Locational factors of Indian industries – Cotton, Jute, Textile, Iron and Steel, Aluminium, Fertiliser, Paper, Chemical, Pharmaceutical and Automobile industries.

Unit–II: Industrial houses and complexes including public sector undertakings; Industrial regionalisation; New industrial policies; Multinationals and liberalization; Special Economic Zones.

Reference:

1. Andreae, B.(1981) Farming Development and Scope: A World Agricultural Geography, Water de Grytar, New York
2. Hussain M. (1997) Systematic Agricultural Geography, Rawat Publications, Jaipur
3. Singh, J. and S.S. Dhillon (1984) Agricultural Geography, TataMcGraw Hills, New Delhi.
4. Hamillton, F.E.I.: Spatial Perspectives on Industrial Organisation and Decision Making, John Wiley, New York 1974.
5. Hamilton, I. (ed.): Resources and Industry, Oxford University Press, New York, 1992.
6. Husain, Majid : Agricultural Geography, Inter-India Publications, Delhi, 1979.
7. Morgan, WB and Munton R.J.C.: Agricultural Geography, Methuen, London, 1977.
8. Singh J. and Dhillion. S.S. Agriculture Geography, McGraw Hill, India, New Delhi 1984.
9. Symons. L.: Agricultural Geography, Bell and Sons, London, 1972.

Course No. – C-8

Course Name: QUANTITATIVE METHODS IN GEOGRAPHY

Unit–I: Introduction: Sources and types of data; Sampling: Methods, classification and tabulation of data; Basics of computer: Hardware and software; MS-Office and scanning.

Unit–II: Descriptive and Applied Statistics: Scatter diagram; Correlation coefficient; Regression Analysis; Time series analysis; Test of significance: Students′t-Test, Chi-square test, F Test; Lorenz curve; Ginni's coefficient.

Unit–III: Thematic mapping: Crop combination, agricultural efficiency, location quotient, co-efficient of geographical association; Spatial distribution of population and population potential.

References:

1. Alvi, Z. 1995: Statistical Geography-Methods & Application, Rawat Publications, Jaipur.

2. Bailey, T. C. and A. C. Gatrell (1995). Interactive Spatial Data Analysis. Essex, England, Prentice Hall.
3. Clark, W.A.V. and Hosking, P.L. 1986: Geographical Methods for Geographers, John Wiley and Sons, New York
4. Cliff, A. D. and J. K. Ord (1981). Spatial Processes: Models & Applications. London, Pion.
5. Cressie, N. A. C. (1993). Statistics for spatial data. New York, J. Wiley.
6. Croxton, F.E., Cowden, D.J. & Klein, S 1969: Applied General Statistics, Prentice Hall of India Pvt. Ltd., New Delhi
7. Dickinson, G.C. (1973): Statistical Mapping and Presentation of Statistics
8. Fotheringham, A. S. (1997). "Trends in quantitative methods I: Stressing the local." Progress in Human Geography21(1): 88-96.
9. Fotheringham, A. S., C. Brunsdon and M. Charlton (2000). Quantitative Geography: Perspectives on Spatial Data Analysis. London; Thousand Oaks, Calif., Sage Publications.
10. Getis, A., Ed. (2004). Spatial Econometrics and Spatial Statistics, Palgrave Macmillan.
11. Griffith, D. A., L. J. Layne, J. K. Ord and A. Sone (1999). A Casebook for Spatial Statistical Data Analysis: A Compilation of Analyses of Different Thematic Data Sets. New York, Oxford University Press.
12. Haining, R. P. (2003). Spatial Data Analysis: Theory and Practice. Cambridge; New York, Cambridge University Press.

13. Hamilton, L. C. (1992). Regression With Graphics: A Second Course in Applied Statistics. Belmont, California, Duxbury Press.
14. Poon, J. P. H. (2003). "Quantitative methods: Producing quantitative methods narratives." Progress in Human Geography 27(6): 753-62.
15. Rogerson, P. (2006). Statistical Methods for Geography. London, SAGE Publications.

SEMESTER – III

Course No. – C-9

Course Name: REGIONAL GEOGRAPHY OF INDIA & WEST BENGAL

Unit–I: Region, Regionalization and Regional Planning: Concept of region, Classification of region, Methods of delineation of Region, Schemes of Regionalization of India, Physiographic divisions; Climate: Characteristics and regional variations; Vegetation: Types and distribution; Major soil types; Coastal and marine resources; Water resources; Mineral and power resources.

Unit–II: Characteristics and problems of Indian agriculture; Green and white revolutions; Agro-climatic and agro-ecological regions; Industries: Major industries and industrial regions; Industrial policy: Five year plans, Globalisation and Liberalisation; Industrial problems, Regional disparity, Geo-environmental and Geo-political issues and management.

WEST BENGAL

Unit–III: Physiography, Climate, Soil, Vegetation of West Bengal, Major Industries, Regional disparity, Geo-environmental and Geo-political issues and management

References

1. Bagchi, K. and Mukherjee, K. N. : Diagnostic survey of West Bengal, A Research Publication,Vols. I – IV, Calcutta University, 1980.
2. Bose, S. C., 1978: Geography of West Bengal, National Book Trust, India, New Delhi, Second Revised Edition.
3. Centre for Science & Environment (1988) State of India's, Environment, New Delhi.
4. Centre for studies in Social Sciences: Problems of the economy and planning in West Bengal.
5. Chatterjee, A. B., Gupta, Avijit and Mukhopadhyay, Pradip K. (Ed.) 1970: West Bengal Firma K L Mukhopadhyay, Calcutta.
6. Dasgupta, B. (Ed.) – Urbanisation, Mirgration and rural change: A Study of West Bengal.

7. Deshpande, C. D., 1992: India: a Regional Interpretation ICSSR & Northern Book Centre.
8. Dreze, Jean & Amartya Sen (ed.) 1996: India Economic development and Social opportunity. : Oxford University Press, New Delhi.
9. Ghosh, Arun, 1989: West Bengal: Landscapes, Nov. 1983 – Feb. 1983- Feb. 1986, A Travel Diary, K. P. Bagchi & Company, Calcutta, First Edition.
10. Govt. of West Bengal – West Bengal Forests. (Forest Directorate Centenary Commemoration Volume)
11. Hunter, W. W. : Statistical Accounts of Bengal, Trubner & Company, 1875, London, UK, First Edition in India in 1973 by D. K. Publishing House, Delhi, India.
12. Krishnan, M. S., 1982: Geology of India & Burma, CBS Publishers & Distributors India, New Delhi, Sixth Edition.
13. Kundu, A. and Raza, Moonis, 1982: Indian Economy: the Regional Dimension. Spectrum Publishers, New Delhi.
14. Mukherjee, K. N., 1996: Agricultural land capability of West Bengal: Part – I : West Bengal, Part – II: The Ganga Delta, Ma Sitala Composing Works, Calcutta, First Edition.
15. Oldham, R. D. : Manual of Geology of India (Vide O'Malley).
16. Pascoe, Kt., Edwin H. (Ed) 1959: A Manual of the Geology of India and Burma, Geological Survey of India, Calcutta Third Edition, revised & Largely rewritten.
17. Robinson, Francis, 1989: The Cambridge Encyclopaedia of India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan & Maldives. Cambridge University Press, London.
18. Saklani, P. S., (Ed.) 1978: Tectonic geology of the Himalaya, Today and Tomorrow's Printers & Publishers, New Delhi, India, First Edition.
19. Singh, R. L. (Ed.) 1971: India: A Regional Geography, National Geographical Society, India, Varanasi.
20. Spate, OHK & ATA Learmonth, 1967: India & Pakistan Methuen, London.
21. Vaidyanadhan, R., (Ed.) 1991: Quaternary Deltas of India, Memoir 22, Geological Survey of India, Bangalore.
22. Wadia, D. N. 1975: Geology of India, Tata McGraw–Hill Publishing Company Ltd., New Delhi, Fourth Edition.

Course No. – C 10

Course Name: REMOTE SENSING & GIS

Unit–I: Fundamentals: Definition and scope of remote sensing; Electro-magnetic radiation: Characteristics, interaction with matter; Remote sensing regions and bands; Spectral signature; Types of remote sensing; Resolution of remote sensing data. Aerial photos: Types, scale, resolution; Geometric properties of aerial photos; Stereoscopy; Stereoscopic parallax; Relief displacement; Digital photogrammetry and orthophotos; Aerial photo interpretation: Identification of objects and features, Determination of photo scale, Determination of height of objects from single photographs, Land use/Land cover mapping and interpretation.

Unit–II: Satellite imagery: Characteristics of remote sensing satellite orbits; Characteristics of sensors – MSS and LISS; Satellite image interpretation: Visual image interpretation – Elements of image interpretation; Digital image processing and

interpretation; Application of remote sensing; Land use/Land cover and geomorphological mapping.

Laboratory Exercise: Data input, Georeferencing, Image subset, Mosaicing, Image classification: Supervised and unsupervised, Map composition.

Unit–III: GIS and its application: Definition and development of GIS; Components of GIS; Functions in GIS; Spatial data model; Raster and vector data; Digital Elevation Model (DEM): Characteristics and applications; Integration of Remote sensing and GIS; Applications of GIS.

Laboratory Exercise: Georeferencing, Database generation, Digitization, Raster and vector based analysis, spatial analysis, Network analysis, Map composition.

References:

1. Burrough, P.A and McDonnell, R.A.,1998: Principles of Geographical Information Systems, Oxford University Press, Oxford.
2. Campbell, J.B. 1996: Introduction to Remote Sensing, Taylor & Francis, London.
3. Chang, K-T. 2017: Introduction to Geographic Information Systems, McGraw Hill Education, New York.
4. Heywood, I., Cornelius, S. and Carver, S., 2001: An Introduction to Geographical Information Systems, Pearson Education, Indian Branch, Delhi.
5. Joseph, G. 2005: Fundamentals of Remote Sensing, Universities Press, Hyderabad.
6. Lillesand, T.M., Kiefer, R.W. and Chipman, J. 2003: Remote Sensing and Image Interpretation, John Wiley & Sons, Inc. New York.
7. Lo, C.P, Yeung and A.K.W 2002: Concepts and Techniques of Geographic Information Systems, Prentice Hall, New Jersey.
8. Nag, P, ed 1992: Thematic Cartography and Remote Sensing, Concept Publishing Co., New Delhi.
9. Narayan, L.R.A. 1999: Remote Sensing and Its Application, Universities Press (India) Ltd., Hyderabad.

Course No. – DCE-1A

Course Name: FLUVIAL GEOMORPHOLOGY-I

Unit–I: Fundamentals of river hydraulics and mechanics: Fluid mechanics, forces acting in channel, flow velocity and its distribution, factors controlling flow velocity, measurement of flow velocity and discharge, types of stream flow.

Unit–II: Hydraulic geometry: Variation of hydraulic characteristics at a given cross section, variation of hydraulic characteristics in a downstream direction, longitudinal profile of the river channel, Drainage basin as a fundamental geomorphic unit: Basin morphometry – Linear, areal and relief aspects of the basin.

Unit–III: Channel patterns and behavior: Straight channel, braided channel, meandering channel, meandering valleys; Configuration of floodplain channels; Behavior of tidal channels and associated problems in South Bengal; Flood problems of West Bengal and their remedies with special reference to North Bengal.

References:

1. Basu, S.R.: On some aspects of fluvial dynamics of river Bhagirathi, Indian Journal of River Valley Development, 17 No. 11.
2. Basu, S.R., 1981: Some consideration on the process of sedimentation in Hooghly tidal channel, North Bengal University Review (Science & Technology), Vol.2.
3. Chorley, Richard J., (Ed.), 1969: Water, Earth and Man: A synthesis of Hydrology, Geomorphology and Socio-economic Geography, Methuen and Company Ltd., New York, USA.
4. Chow, Ven Te, (Editor-in-Chief), 1964: Handbook of Applied Hydrology: A Compendium of Water-resources Technology, McGraw–Hill Book Company, New York, USA.
5. Compton, Robert R., 1965: Manual of Field Geology, Wiley Eastern Pvt. Ltd., New Delhi, Second Edition.
6. Crickmay, C.H., 1974: The Work of the River: A critical study of the central aspects of Geomorphogeny, The Macmillan Press Ltd., London, UK, First Edition.
7. Doornkamp, John C. and King, Cuchlaine A.M.,1971: Numerical analysis in Geomorphology: An introduction, St. Martin's Press, New York, USA, First Edition.
8. Dury, G.H., (Ed.), 1970: Rivers and River Terraces, Macmillan, Edinburgh, UK.
9. Dury, G.H., (Ed.), 1966: Essays in Geomorphology, Heinemann Educational Book Ltd., London, UK.
10. Eagleson, Peter S., 1970: Dynamic Hydrology, McGraw-Hill Book Company, New York, USA, First Edition.

Course No. – DCE-1B

Course Name: CARTOGRAPHY-I (Theory)

Unit-1: Concepts in Cartography, Geodesy and Spherical Trigonometry

1.1 History and development of Cartography.

1.2 Geodesy –Shape and size of Earth, Concept of Datum.

1.3 Plane and spherical co-ordinates, UTM and UPS grid systems.

1.4 Spherical Trigonometry –Spherical triangle, Napier's rule, Spherical excess.

1.5 Application of Spherical Trigonometry in the determination of distance, azimuth and area on the earth's surface.

Unit-II: Determination of Distance, Azimuth and Scale Variations on some selected Map Projections

2.1 Conical Orthomorphic with two standard parallels.

2.2 Conical Equal Area with two standard parallels.

2.3 Cylindrical Equal Area Projection with two standard parallels.

2.4 Mercator's Projection.

2.5 Mollweide's Projection (Normal case)

Unit-III: Mapping Elements and Thematic Mapping

3.1 Maps: Characteristics and Categories.

3.2 Cartographic Generalization: Elements, Controls and manipulations.

3.3 Cartographic techniques and methods in preparation of diagrams and maps with special emphasis on Choropleth Map

3.4 Basic concept of Digital Cartography

3.5 Basic concept of Open street map and Mobile Mapping

References

1. Campbell, J.B. 1996: Introduction to Remote Sensing, 2nd edition, Taylor & Francis, London
2. Chaisman, N. 1992: Exploring Geographical Information Systems, John Wiley and Sons Inc., New York.
3. Deetz, C. H. Adams O. S. – Elements of Map Projection.
4. Gupta, R. K. – Planning Natural Resources.
5. Hanks, A. R. – Map Projection, 2nd Edition 1942.
6. Higgings, A. L. – Higher surveying.
7. John Uren & Bill Price (2010). Surveying for Engineers Palgrave Macmillan; Fifth edition
8. Kanetkar, T. G. & Konkani S. V. – Surveying and leveling Part I & II.
9. Kanetkar, T. P. and Kulkarni, S.V. (2006). Surveying and Levelling Vol. I and Vol. II Vidyarthi Griha Prakashan, Pune
10. Kellaway, G. P. – Map Projections 1st Indian Edition, 1974.
11. Kumar, G. S. – Aerial Photography.
12. Lieder, D. R. – Aerial Photo Interpretation – Principles theories and application.

13. Lillesand, T.M. and Kiefer, R. W. 1994: Remote Sensing and Image Interpretation, 3rd edition, John Wiley and Sons, New York.
14. Mailing, D. H. – Map Projection.
15. Marcolongo, B. And Mantorani, F. 1997: Photogeology: Remote Sensing Application in Earth Science, Oxford and IBH Pub. Pvt. Ltd., New Delhi
16. Misra, R. P. – Fundamentals of Cartography.
17. Punmia,B.C, Ashok K. Jain, Arun K. Jain (2016). Surveying, Vol. I & II Laxmi Publications.
18. Raisz, E. – General Cartography.
19. Raisz, E. – Principles of Cartography.
20. Rajan, M.S. 1995: Space Today, 2nd edition, National Book Trust, New Delhi.
21. Rao, U.R. 1996: Space Technology for Sustainable Development, Tata McGraw-Hill, New Delhi
22. Robinson, A. – Elements of Cartography.
23. Roy, P. – An analytical Study of Map Projection, 1988.
24. S. K. Duggal (2017). Surveying, Vol. I & II McGraw Hill Education; Fourth edition
25. Sabins, F.F., 1997: Remote Sensing: Principles and Applications, 3rd edition, W.H. Freeman & Company, New York
26. Steer, J. A. – An introduction to the Study of Map Projection.
27. Subramanian (2015). Surveying and Levelling, Oxford University Press.
28. Tobler, W. R. – A classification of Map Projection.

Course No. – DCE-1C

Special Course: URBAN GEOGRAPHY–I

Unit–I: Scope and content of Urban Geography; Definition of urban places; Origin and growth of Pre-industrial cities; the ancient cities and the medieval cities; Growth of modern cities; Trends in urbanization in the third world during the modern period with particular reference to India;

Unit-II: Classification of urban settlements: Functional Classification of Urban Centres and the concept of Basic and Non-Basic Functions; Theories on urban land use structure; Urban Morphology with particular reference to Indian cities; Structure and Functions of the C.B.D.

Unit–III: Concept of sub-urbanization, counter urbanization and re-urbanization; Size and spacing of cities with reference to rank-size relationships, The Urban Environment: Physical and Social, Sustainable Urban Planning: Policy and Practice

References

1. Carter, H. 1995. The Study of Urban Geography, 4th ed, Arnold.
2. Giuliano, G., Hanson, S. (Eds) 2017. The Geography of Urban Transportation, 4th ed, Guilford Press.
3. Gottdiener, M., Budd, M. Lehtovuori, P. 2016. Key Concepts in Urban Studies, 2nd ed, Sage.
4. Jonas, A.E.G., McCann, E., Thomas, M. 2015. Urban Geography: A Critical Introduction, Wiley-Blackwell.
5. Kaplan, D., Holloway,S. 2014. Urban Geography, 3rd ed, Wiley.
6. Knox, P.L., McCarthy, L.M. 2011. Urbanization: An Introduction to Urban Geography, 3rd ed, Pearson.
7. Latham, A., McCormack, D., McNamara, K. McNeill, D. 2009.Key Concepts in Urban Geography, Sage.
8. LeGates, R.T., Stout, F. (Eds) 2015 The City Reader, 6th ed, Routledge.
9. Levy, J.M. 2016. Contemporary Urban Planning, 11th ed, Routledge.
10. Macionis, J.J., Parrillo, V.N. 2016. Cities and Urban Life, 7th ed, Pearson.
11. Mandal, R.B. 2008. Urban Geography: A Text Book, Concept Publishing Company.
12. Pacione, M. 2009. Urban Geography: A Global Perspective, Routledge.
13. Potter, R.B., Lloyd-Evans, S. 2014. The City in the Developing World, Routledge.
14. Ramachandran, R. 1989. Urbanisation and Urban Systems in India, Oxford University Press.
15. Ramachandran, R., 1992: The Study of Urbanisation, Oxford University Press.
16. Singh, R.B. (Ed.) (2015) Urban development, challenges, risks and resilience in Asian megacities. Advances in Geographical and Environmental Studies, Springer.

Course No. – GE-I

Course Name: SOCIAL, CULTURAL & POLITICAL GEOGRAPHY

Unit–I: Nature and scope of social geography; Social structure and social processes; Elements of social geography - Ethnicity, tribe, dialect, language, caste and religion; Concept of social well-being.

Unit–II: Nature and scope of cultural geography; Environment and culture; Concept of cultural-areas and cultural regions; Theories of tribal groups; Dwelling places as cultural expressions.

Unit–III: Definition and scope of Political geography; Geopolitics; Global strategic views (Heartland and Rimland theories); Concept of Nation, State and Nation-state; Boundaries and frontiers; Politics of world resources; Geography and Federalism.

References:

1. Ahmad, Aijazuddin, Social Geography, Rawat Publication, New Delhi, 1999.
2. De Blij. B.d. Human Geography. John Wiley and Son, New York.
3. Dreze Jean, Amartya Sen, Economic Development and Social Opportunity, Oxford University press, New Delhi,1996 .
4. Dubey, S.C.: Indian Society, National Book Trust, New Delhi, 1991.
5. Gregory, D. and UJ. Larry. (eds.) Social relations and Spatial Structures, McMillan, 1985
6. Haq, Mahbubul: Reflection on Human Development. Oxford University Press.New Delhi
7. Agnew, J.A. (1987), Place and Politics, Boston: Allen and Unwin
8. Blacksell, Mark (2003), Political Geography, London Routledge.
9. Cox, Kevin R. (2008) The Sage Handbook of Political Geography, New Delhi sage.
10. Dicken, Peter (2003), Global Shift, New Delhi: Sage
11. Dikshit, R.D. (2000) Political Geography: The Spatiality of Politics, New Delhi: Tata Mc Graw Hill
12. Jones, Martin Rhys Jones and Michael Woods (2003), An Introduction to Political Geography, London: Routledge
13. Khor, Martin (2001) Rethinking in Globalization, London: Zed Books.
14. Painter J. (1995) Politics, Geography and Political Geography, London: Arnold.
15. Taylor, P.J. and Colin Flint (2001), Political Geography, New Delhi: Pearson.
16. Taylor, P.J. and R.J. Johnston (1979), Geography of Elections Hammondsworth: Penguin
17. Adhikari, Sudeepto (2008), Political Geography of India, Allahabad: Sharda Pustak Bhandar

Course No. – DCE-2A

Special Course: FLUVIAL GEOMORPHOLOGY–II (Theory)

Unit–I: Evolution of drainage patterns and geomorphic characteristics of– Ganga, Brahmaputra, Tista and Narmada; Major changes of river courses in Bengal during historical period: Damodar and Bhagirathi-Hooghly.

Unit–II: Human influence on channel behavior: Effect of dam and embankments, river-bed mining, Management of Flood, River Bank Erosion and Channel Shifting, Palaeo-channel.

Unit–III: National policy of water resource development: Irrigation and water power, National water grid, Flood control and stream flow routing; Application of remote sensing and GIS in fluvial geomorphology.

References:

1. Basu, S.R., 1981: Some consideration on the process of sedimentation in Hooghly tidal channel, North Bengal University Review (Science & Technology), Vol.2.
2. Basu, S.R.,: On some aspects of fluvial dynamics of river Bhagirathi, Indian Journal of River Valley Development, 17 No. 11.
3. Chorley, Richard J., (Ed.), 1969: Water, Earth and Man: A synthesis of Hydrology, Geomorphology and Socio-economic Geography, Methuen and Company Ltd., NewYork, USA.
4. Chow, Ven Te, (Editor-in-Chief), 1964: Handbook of Applied Hydrology: A Compendium of Water-resources Technology, McGraw–Hill Book Company, New York, USA.
5. Compton, Robert R., 1965: Manual of Field Geology, Wiley Eastern Pvt. Ltd., New Delhi, Second Edition.
6. Crickmay, C.H., 1974: The Work of the River: A critical study of the central aspects of Geomorphogeny, The Macmillan Press Ltd., London, UK, First Edition.
7. Doornkamp, John C. and King, Cuchlaine A.M.,1971: Numerical analysis in Geomorphology: An introduction, St. Martin's Press, New York, USA, First Edition.
8. Dury, G.H., (Ed.), 1966: Essays in Geomorphology, Heinemann Educational Book Ltd., London, UK.
9. Dury, G.H., (Ed.), 1970: Rivers and River Terraces, Macmillan, Edinburgh, UK.
10. Eagleson, Peter S., 1970: Dynamic Hydrology, McGraw-Hill Book Company, New York, USA, First Edition.
11. Embleton, Clifford, Burnsden, D. and Jones, D.K.C., (Ed.), 1978: Geomorphology: Present problems and future prospects, Oxford University Press, Oxford, UK, First Edition.
12. Gregory, K.J., (Ed.), 1977: River Channel Changes, John Wiley & Sons, Chichester, UK, First Edition.
13. Institute of Civil Engineering, 1966, River Flood Hydrology, ICE, London.
14. Julien, Pierre Y., 1988: Erosion and Sedimentation, Cambridge University Press, Cambridge, UK, First Edition.
15. Kirkby, M.J., (Ed.), 1978: Hillslope Hydrology, John Wiley & Sons, Chichester, London, UK.
16. Knighton, David, 1998: Fluvial forms and processes: A new perspective, Arnold Publishers, Cornwall, UK, First Edition.
17. Leopold, Luna B., Wolman, M. Gordon and Miller, John P., 1970: Fluvial Processes in Geomorphology, S. Chand and Company Ltd., New Delhi, First Indian Reprint
18. Linsley Jr., Ray K., Kohler, Max A. and Paulhus & Joseph, L.H., 1949: Applied Hydrology, McGrew-Hill Civil Engineering Series, McGrew-Hill Book Company, New York, USA, First Edition.
19. Maidment, David R., (Editor-in-Chief) 1993: Handbook of Hydrology, McGraw-Hill, Inc., New York, USA, First Edition.
20. Morisawa, Marie, (Ed.), 1981: Fluvial Geomorphology, George Allen and Unwin, London, UK.
21. Morisawa, Marie, 1968: Streams: their dynamics and morphology, Earth and Planetary Science Series, McGraw-Hill Book Company, New York, First Edition.
22. Morisawa, Marie, 1985: Rivers: Form and Process, Geomorphology Texts, Longman Group Ltd., New York, First Edition

23. Mutreja, K.N., 1986: Applied Hydrology, Tata McGraw-Hill Publishing Company, Ltd., New Delhi, India, First Edition.
24. Newson, Malcolm, 1994: Hydrology and the Environment, Oxford University Press, New York, USA, First Edition.
25. Rao, K.L., 1979: India's Water Wealth: Its Assessment, Uses and Projections, Orient Longman Limited, New Delhi, Revised Edition.
26. Richards, Keith, (Ed.), 1987: River Channels: Environment & Process, Basil Blackwell, Oxford, UK, First Edition.
27. Richards, Keith, 1982: Rivers: Form and Processes in Alluvial Channels, Methuen & Company Ltd., New York, USA, First Edition.
28. Saha, S.K. and Barrow, Christopher, J., (Ed.), 1981: River basin planning: Theory and Practice, John Wiley & Sons, Chichester, USA.
29. Schumm, Stanley Alfred and Mosley, M. Paul, (Ed.), 1973: Slope Morphology, Benchmark Papers in Geology, Dowden, Hutchinson & Ross, Inc., Pennsylvania, USA.
30. Schumm, Stanley Alfred, 1977: The Fluvial System, John Wiley & Sons, Inc., A Wiley-Interscience Publications, New York, USA, First Edition.
31. Slaymaker, Olav, (Ed.), 2000: Geomorphology, human activity and global environment, John Wiley & Sons, Ltd., England, UK.
32. Smith, David Ingle and Stopp, Peter, 1978: The River Basin: An introduction to the study of hydrology, Cambridge University Press, Cambridge, UK, First Edition.
33. Smith, Keith and Ward, Roy, 1998: Floods: Physical processes and Human Impacts, John Wiley & Sons, Chichester, England, UK, First Edition.
34. Statham, Ian, 1979: Earth Surface Sediment Transport: Contemporary problems in Geography, Oxford University Press, Oxford, UK, First Edition.
35. Ward, R.C., 1967: Principles of Hydrology: McGraw-Hill Publishing Company, Ltd., London, UK, First Edition.
36. Ward, Roy, 1978: Floods: A geographical perspective, Focal problems in Geography, The Macmillan Press Ltd., London, UK, First Edition.
37. Young, A., 1972: Slopes, Geomorphology Text 3, Oliver & Boyd, Edinburgh, UK, First Edition.

Course No. – DCE-2B

Special Course: CARTOGRAPHY–II (Theory)

UNIT - I: Surveying with Theodolite and Levels

1.1 Theodolite Traversing (Omitted Measurements), Determination of coordinates and area from the data.

1.2 Principles and methods of Triangulation Surveying, Base line measurement and corrections, Satellite stations.

1.3 Principles, corrections for curvature and refraction of Reciprocal Surveying, and determination of reduced level of a place.

UNIT – II: **Satellite Remote Sensing**

2.1 Definition and Physics of Remote Sensing

2.2 Spectral Signature and its Response of Soil, Vegetation, Built-up and Water

2.3 Basic Concept of Visual, Thermal, Infra-Red, Hyperspectral, Microwave, RADAR, LIDAR Remote Sensing

2.4 Digital Image Processing, Image Rectification, Image enhancements, Image classification and accuracy assessment

Unit-III: GIS

3.1 Data Input & Editing in GIS

3.2 Modeling for Decision Making Process and GIS Models: Raster and Vector

3.3 Interpolation, Overlay, Buffering, and Neighbourhood Functions

3.4 Basic Knowledge of Google Earth Engine API

References:

1. Campell, J. B. (2003): Introduction to Remote Sensing. 4th ed. Taylor and Francis, London.
2. Cracknell, A. and Ladson, H (1990): Remote Sensing Year Book. Taylor and Francis, London.
3. Curran, P.J. (1985): Principles of Remote Sensing. Longman, London.
4. Deekshatulu, B.L. and Rajan, Y.S. (ed.) (1984): Remote Sensing. Indian Academy of Science, Bangalore.
5. Duggal, S. K. (2017). Surveying, Vol. I & II McGraw Hill Education; Fourth edition
6. Floyd, F. and Sabins, Jr. (1986): Remote Sensing: Principles and Interpretation. W.H. Freeman, New York.
7. Gautam, N.C. and Raghavswamy, V. (2004): Land Use/ Land Cover and Management Practices in India. B.S. Publications., Hyderabad.
8. Harry, C.A. (ed.) (1987): Digital Image Processing. IEEE Computer Society, California.
9. Hord, R.M. (1982): Digital Image Processing of Remotely Sensed Data. Academic Press, New York.
10. Jensen, J.R. (1986): Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice-Hall, Englewood Cliffs, New Jersey.
11. Jensen, J.R. (2004): Remote Sensing of the Environment: An Earth Resource Perspective. Prentice-Hall, Englewood Cliffs, New Jersey. Indian reprint available.
12. John Uren & Bill Price (2010). Surveying for Engineers Palgrave Macmillan; Fifth edition

13. Kanetkar T. P. and .Kulkarni, S.V (2006). Surveying and Levelling Vol. I and Vol. II Vidyarthi Griha Prakashan, Pune
14. Lillesand, T.M. and Kiefer, R.W. (2000): Remote Sensing and Image Interpretation. John Wiley and Sons, New York.
15. Nag, P. (ed.) (2000): Thematic Cartography and Remote Sensing. Concept Publishing. Company, New Delhi.
16. Nag, P. and Kudrat, M. (1998): Digital Image Processing, Concept Publishing Company, New Delhi.
17. Punmia, B. C. , Ashok K. Jain, Arun K. Jain (2016). Surveying, Vol. I & II Laxmi Publications.
18. Rampal, K.K. (1999): Handbook of Aerial Photography and Interpretation. Concept Publishing. Company, New Delhi.
19. Reeves, R.G. (ed.) (1983): Manual of Remote Sensing, Vols. 1 and 2. American Society of Photogrammetry and Remote Sensing, Falls Church, Virginia.
20. Renz, A.N. (ed.) (1999): Remote Sensing for the Earth Sciences: Manual of Remote Sensing. American Society of Photogrammetry and Remote Sensing, and John Wiley and Sons, New York.
21. Siegel, B.S. and Gillespie, R. (1985): Remote Sensing in Geology. John Wiley and Sons, New York
22. Subramanian (2015). Surveying and Levelling, Oxford University Press.
23. Swain, P.H. and Davis, S.M. (ed.) (1978): Remote Sensing: The Quantitative Approach. McGraw Hill, New York.
24. Venkatramaiah, C. (2011). Textbook of Surveying, Orient Blackswan Private Limited - New Delhi

Course No. – DCE-2C

Special Course: URBAN GEOGRAPHY

Unit–I: The Concept and Structure of the city Region; Impact of the city on its countryside; Demographic Characteristics of urban populations; Pattern of rural-urban migration: its causes and impact; urban land values: Factors determining urban land values; spatial structure of urban land values; urban land value theory.

Unit–II: Urbanization and environmental problems; Sustainable development and cities: its needs and implications; city as an ecological unit; Solid waste Management: Types and various sources; Associated problems and planning with particular reference to Indian cities. Slums, urban renewal and urban sprawl in India.

Unit–III: Critical Overviews of Urban Planning: JNNURM, Slum-Free Cities, Smart Cities, Concept of PURA, Urban environment, Urban land-use, Urban ecology and Urban management, Urban renewal – Gentrification and Strategies for the Global South

References

1. Carter, H. 1995. The Study of Urban Geography, 4th ed, Arnold.
2. Giuliano, G., Hanson, S. (Eds) 2017. The Geography of Urban Transportation, 4th ed, Guilford Press.
3. Gottdiener, M., Budd, M. Lehtovuori, P. 2016. Key Concepts in Urban Studies, 2nd ed, Sage.
4. Jonas, A.E.G., McCann, E., Thomas, M. 2015. Urban Geography: A Critical Introduction, Wiley-Blackwell.
5. Kaplan, D., Holloway,S. 2014. Urban Geography, 3rd ed, Wiley.
6. Knox, P.L., McCarthy, L.M. 2011. Urbanization: An Introduction to Urban Geography, 3rd ed, Pearson.
7. Latham, A., McCormack, D., McNamara, K. McNeill, D. 2009.Key Concepts in Urban Geography, Sage.
8. LeGates, R.T., Stout, F. (Eds) 2015 The City Reader, 6th ed, Routledge.
9. Levy, J.M. 2016. Contemporary Urban Planning, 11th ed, Routledge.
10. Macionis, J.J.,Parrillo, V.N. 2016. Cities and Urban Life, 7th ed, Pearson.
11. Mandal, R.B. 2008. Urban Geography: A Text Book, Concept Publishing Company.
12. Pacione, M. 2009. Urban Geography: A Global Perspective, Routledge.
13. Potter, R.B., Lloyd-Evans, S. 2014. The City in the Developing World, Routledge.
14. Ramachandran, R. 1989. Urbanisation and Urban Systems in India, Oxford University Press.
15. Ramachandran, R., 1992: The Study of Urbanisation, Oxford University Press.
16. Singh, R.B. (Ed.) (2015) Urban development, challenges, risks and resilience in Asian megacities. Advances in Geographical and Environmental Studies, Springer.

Course No. – DCE-3A

Special Course: FLUVIAL GEOMORPHOLOGY–III (Practical)

PRACTICAL

Unit–I: Stream network and catchment extraction; Morphometric analysis: Linear aspects – Stream ordering, Stream frequency, Bifurcation ratio, Stream length, Stream length ratio, Sinuosity index; Aerial aspects – Basin length, Basin area, Basin perimeter, Circularity ratio, Elongation ratio, Drainage density; Relief aspect – Relative relief, Dissection index, Average slope, Ruggedness index,

Unit–II: Stream cross and longitudinal profile. Measurement of stream discharge; Preparation of Hydrograph, Unit Hydrograph and Rating Curve, Calculation of velocity and discharge using Manning equation.

Unit–III: Geomorphological mapping and analysis: Generation of Digital Elevation Model (DEM); Topographical and hydrological parameters extraction from DEM; Fluvial landforms and flood hazard mapping from geospatial data.

References:

1. Basu, S.R., 1981: Some consideration on the process of sedimentation in Hooghly tidal channel, North Bengal University Review (Science & Technology), Vol.2.
2. Basu, S.R.: On some aspects of fluvial dynamics of river Bhagirathi, Indian Journal of River Valley Development, 17 No. 11.
3. Chorley, Richard J., (Ed.), 1969: Water, Earth and Man: A synthesis of Hydrology, Geomorphology and Socio-economic Geography, Methuen and Company Ltd., New York, USA.
4. Chow, Ven Te, (Editor-in-Chief), 1964: Handbook of Applied Hydrology: A Compendium of Water-resources Technology, McGraw–Hill Book Company, New York, USA.
5. Compton, Robert R., 1965: Manual of Field Geology, Wiley Eastern Pvt. Ltd., New Delhi, Second Edition.
6. Crickmay, C.H., 1974: The Work of the River: A critical study of the central aspects of Geomorphogeny, The Macmillan Press Ltd., London, UK, First Edition.
7. Doornkamp, John C. and King, Cuchlaine A.M.,1971: Numerical analysis in Geomorphology: An introduction, St. Martin's Press, New York, USA, First Edition.
8. Dury, G.H., (Ed.), 1966: Essays in Geomorphology, Heinemann Educational Book Ltd., London, UK.
9. Dury, G.H., (Ed.), 1970: Rivers and River Terraces, Macmillan, Edinburgh, UK.
10. Eagleson, Peter S., 1970: Dynamic Hydrology, McGraw-Hill Book Company, New York, USA, First Edition.
11. Embleton, Clifford, Burnsden, D. and Jones, D.K.C., (Ed.), 1978: Geomorphology: Present problems and future prospects, Oxford University Press, Oxford, UK, First Edition.
12. Gregory, K.J., (Ed.), 1977: River Channel Changes, John Wiley & Sons, Chichester, UK, First Edition, Institute of Civil Engineering, 1966, River Flood Hydrology, ICE, London.

Course No. – DCE-3B

Special Course: CARTOGRAPHY–III (Practical)

Unit-1: Surveying, Levelling and Location of Points by GPS

1.1. Determination of area by traversing with Theodolite.

1.2 Determination of reduced level of a place by Reciprocal survey by Dumpy level.

1.3 Preparation of Map using Total Station.

1.4 Use of GPS for planimetric and altimetric locations of points

UNIT - II: Map Projections: Principle, Properties, Use, Mathematical Derivations and Drawing of Graticule

2.1 La Hire's Projection

2.2 Conical equal area and Orthomorphic Projection with two standard parallels

2.3 Mercator's Projection

2.4 Modified International Projection

2.5 Parabolic Projection (Normal case)

UNIT-III: Satellite Remote Sensing and GIS

3.1 Downloading of Satellite Data: IRS LISS-III & LANDSAT-8

3.2 Geo-Referencing, Digitization and Pre-processing of satellite Image

3.3 Image Classification: Supervised and Unsupervised; Accuracy Assessment, Class Editing; Change Detection Study and Layout of Maps

3.4 Preparation of map of selected area using NDVI, NDWI, NDBI by QGIS/ARC-GIS

3.5 Conceptualization and Visualization of GIS Models: Modelling in the Decision Making Process; Visualization of Models – TIN, DEM, DTM

References:

1. Campbell, J.B. 1996: Introduction to Remote Sensing, 2nd edition, Taylor & Francis, London
2. Chaisman, N. 1992: Exploring Geographical Information Systems, John Wiley and Sons Inc., New York.
3. Deetz, C. H. Adams O. S. – Elements of Map Projection.
4. Gupta, R. K. – Planning Natural Resources.
5. Hanks, A. R. – Map Projection, 2nd Edition 1942.
6. Higgings, A. L. – Higher surveying.
7. John Uren & Bill Price (2010). Surveying for Engineers Palgrave Macmillan; Fifth edition
8. Kanetkar, T. G. & Konkani S. V. – Surveying and leveling Part I & II.
9. Kanetkar, T. P. and Kulkarni, S.V. (2006). Surveying and Levelling Vol. I and Vol. II Vidyarthi Griha Prakashan, Pune
10. Kellaway, G. P. – Map Projections 1st Indian Edition, 1974.
11. Kumar, G. S. – Aerial Photography.
12. Lieder, D. R. – Aerial Photo Interpretation – Principles theories and application.
13. Lillesand, T.M. and Kiefer, R. W. 1994: Remote Sensing and Image Interpretation, 3rd edition, John Wiley and Sons, New York.

14. Mailing, D. H. – Map Projection.
15. Marcolongo, B. And Mantorani, F. 1997: Photogeology: Remote Sensing Application in Earth Science, Oxford and IBH Pub. Pvt. Ltd., New Delhi
16. Misra, R. P. – Fundamentals of Cartography.
17. Punmia, B.C, Ashok K. Jain, Arun K. Jain (2016). Surveying, Vol. I & II Laxmi Publications.
18. Raisz, E. – General Cartography.
19. Raisz, E. – Principles of Cartography.
20. Rajan, M.S. 1995: Space Today, 2nd edition, National Book Trust, New Delhi.
21. Rao, U.R. 1996: Space Technology for Sustainable Development, Tata McGraw-Hill, New Delhi
22. Robinson, A. – Elements of Cartography.
23. Roy, P. – An analytical Study of Map Projection, 1988.
24. S. K. Duggal (2017). Surveying, Vol. I & II McGraw Hill Education; Fourth edition
25. Sabins, F.F., 1997: Remote Sensing: Principles and Applications, 3rd edition, W.H. Freeman & Company, New York
26. Steer, J. A. – An introduction to the Study of Map Projection.
27. Subramanian (2015). Surveying and Levelling, Oxford University Press.
28. Tobler, W. R. – A classification of Map Projection.

Course No. – DCE-3C

Special Course: URBAN GEOGRAPHY–III (Practical)

Unit–I: Urban market Area and Transport Analysis

a) Break point Analysis, Shimbel Index and detour index
b) Cyclomatic Number Alpha, Beta, Gamma, Eta Index and Aggregate Transportation Score

Unit–II: Interpretation of Urban landscape

a) Analysis of Regional Disparity after Sopher's Index
b) Urban Rank Size Rule and Nearest Neighbour Analysis.
c) Quality of life Index

Unit–III: Quantitative and Qualitative technique in urban geography

a) Regression and Probability
b) Association between Variables; Residual Mapping
c) Urban ethnography – Interview, FGDs, participant observations, RCT

References

1. Carter, H. 1995. The Study of Urban Geography, 4th ed, Arnold.
2. Giuliano, G., Hanson, S. (Eds) 2017. The Geography of Urban Transportation, 4th ed, Guilford Press.
3. Gottdiener, M., Budd, M. Lehtovuori, P. 2016. Key Concepts in Urban Studies, 2nd ed, Sage.
4. Jonas, A.E.G., McCann, E., Thomas, M. 2015. Urban Geography: A Critical Introduction, Wiley-Blackwell.
5. Kaplan, D., Holloway,S. 2014. Urban Geography, 3rd ed, Wiley.
6. Knox, P.L., McCarthy, L.M. 2011. Urbanization: An Introduction to Urban Geography, 3rd ed, Pearson.
7. Latham, A., McCormack, D., McNamara, K. McNeill, D. 2009.Key Concepts in Urban Geography, Sage.
8. LeGates, R.T., Stout, F. (Eds) 2015 The City Reader, 6th ed, Routledge.
9. Levy, J.M. 2016. Contemporary Urban Planning, 11th ed, Routledge.
10. Macionis, J.J.,Parrillo, V.N. 2016. Cities and Urban Life, 7th ed, Pearson.
11. Mandal, R.B. 2008. Urban Geography: A Text Book, Concept Publishing Company.
12. Pacione, M. 2009. Urban Geography: A Global Perspective, Routledge.
13. Potter, R.B., Lloyd-Evans, S. 2014. The City in the Developing World, Routledge.
14. Ramachandran, R. 1989. Urbanization and Urban Systems in India, Oxford University Press.
15. Ramachandran, R., 1992: The Study of Urbanization, Oxford University Press.
16. Singh, R.B. (Ed.) (2015) Urban development, challenges, risks and resilience in Asian megacities. Advances in Geographical and Environmental Studies, Springer.

Course No: GE-2

Course Name: GEOGRAPHICAL ISSUES & RESEARCH METHODOLOGY

ENVIRONMENTAL ISSUES: PHYSICAL

Unit–I: Hazards: Landslide; Earthquake; Flood; Drought; Environmental pollution; Environmental degradation; Deforestation and desertification; Principles of environmental impact assessment and environmental management.

ENVIRONMENTAL ISSUES: SOCIAL

Unit–II: Population Explosion and Food security; Sustainable development; Regional disparities in economic development; Globalization and Indian Economy.

RESEARCH METHODOLOGY

Unit–III: Research in geography: Trends and significance; Formulation of research problem; Development and testing of hypothesis; Research design. Techniques of data collection, Data analysis and interpretation, Preparation of research papers.

References

1. ADB. 1987. Environmental Guidelines for Selected Agricultural and Natural Resources Development Projects. Asian Development Bank, Manila, The Philippines.
2. ADB. 1992. Environmental Assessment Guidelines. African Development Bank, Abidjan, Côte d'Ivoire.
3. ADB. 1992. Guidelines for health impact assessment of development projects. Environment Paper No. 11. Asian Development Bank, Manila, The Philippines.
4. ADB. 1992. Guidelines for the Health Impact Assessment of Development Projects. Asian Development Bank, Manila, The Philippines.
5. ADB. Environment risk assessment: dealing with uncertainty in EIA. Environment Paper No. 7. Asian Development Bank, Manila, The Philippines.
6. Ahmad, Y. and Sammy, G. 1985. Guidelines to Environmental Impact Assessment in Developing Countries. Hodder and Stoughton, London.
7. Ahmad, Y. and Sammy, G. 1988. Public Involvement: Guidelines to EIA in Developing Countries. Hodder and Stoughton, London.
8. Alhéretière, D. 1982. EIA and agricultural development. A comparative law study. Environment Paper No 2. FAO, Rome, Italy.
9. An Introduction to Research Procedure in Social Sciences – Gopal M. A. – Asia Publishing House – Bombay
10. Ayers, R.S. and Westcot, D.W. 1985. Water quality for agriculture. Irrigation and Drainage Paper 29 (Revised). FAO, Rome, Italy.
11. Birley, M. H. 1989. Guidelines for forecasting the vector-borne disease implications of water resource development. PEEM Guidelines Series 2. WHO, Geneva, Switzerland.
12. Biswas, A.K. and Agarwala, S. B. C. 1992. Environmental Impact Assessment for Developing Countries. Butterworth-Heinemenn, Guildford, UK.
13. Biswas, A.K. and Qu Geping. 1987. EIA for Developing Countries. Tycooly Publishing, London.
14. Blum, B. 1984. A Handbook on EIA for Public Decision Makers. UNEP, Paris, France.
15. Burbridge, P.R. 1988. Environmental guidelines for resettlement projects in the humid tropics. FAO Environmental Guidelines Paper 9. Rome, Italy.
16. Cernea, M. and Guggenheim, S. (eds.). 1993. Anthropological Approaches to Resettlement Policy, Practice and Theory. Westview Press, Boulder, Colorado, USA.
17. Chambers, R. 1981. Rural Development - Putting the Last First. Longman, London, UK.
18. Chimbale et al. 1993. Schistosomiasis Control Measures for Small Irrigation Schemes in Zimbabwe. HR Wallingford Report OD 128. Wallingford, UK.
19. Craine, L.E. 1971. Institutions for managing lakes and bays. National Resources Journal II.

20. Darlington, Richard B., Sharon Weinberg, and Herbert Walberg (1973). Canonical variate analysis and related techniques. Review of Educational Research, 453-454.
21. Dugan, P.J. 1990. Wetland Conservation. A Review of Current Issues and Required Action. IUCN. The World Conservation Union, Cambridge, UK.
22. DVWK. 1993. Ecologically sound resources management in irrigation. DVWK Bulletin 19. Verlag Paul Parey, Hamburg/Berlin, Germany.
23. EBRD. 1992. Environmental Procedures. EBRD, London.
24. ERL. 1990. Environmental Assessment Procedures in the UN System. Environmental Resources Limited, London, UK.
25. ESCAP. 1985. EIA Guidelines for Planners and Decision Makers. ESCAP, Geneva, Switzerland.
26. ESCAP. 1987. Environmental Management for Sustainable Socio-economic Development. ESCAP, Geneva, Switzerland.
27. FAO. 1992. Les périmètres irrigués en droit comparé afraicain (Madagascar, Maroc, Niger, Sénégel, Tunisie). FAO, Rome, Italy (French only).
28. Italy.
29. ICOLD. 1980. Dams and the environment. ICOLD Bulletin 35. Paris, France.
30. Mather, T.H. and That, T.T. 1984. Environmental management for vector control of rice fields. Irrigation and Drainage Paper 41. FAO, Rome, Italy.
31. Mekouar, M.A. 1990. The Environmental Impact of Economic Incentives for Agricultural Production: A Comparative Law Study. FAO, Rome, Italy.
32. Mock, J.F. and Bolton, P. 1993. The ICID Environmental Checklist to Identify Environmental Effects of Irrigation, Drainage and Flood Control Projects. HR Wallingford, Wallingford, UK.
33. Morrison, Donald F. (1990) Multivariate Statistical Methods. New York: McGrawHill.
34. Munasinghe, M. 1993. Environmental Economics and Sustainable Development. World Bank, Washington D.C., USA.
35. OECD. 1986. Environmental assessment and development assistance. Environment Monographs No 4. OECD, Paris.
36. Pendse, Y.D., Roa, R.V. and Sharma, P.K. 1989. Environmental impact methodologies. Shortcomings and appropriateness for water resources projects in developing countries. Water Resources Development 5(4).
37. Pescod, M.B. 1992. Wastewater treatment and use in agriculture. Irrigation and Drainage Paper 47. FAO, Rome, Italy.
38. Petermann, T. 1993. Irrigation and the Environment. GTZ, Eschborn, Germany.
39. Phillips, M., Mill, A. and Dye, C. 1993. Guidelines for cost effectiveness analysis of vector control. PEEM Guidelines Series 3. WHO, Geneva.
40. Pike, E.G. 1987. Engineering Against Schistosomiasis/Bilharzia. MacMillan, London.
41. Research Methodology – Methods & Techniques 2 ed, Kothari C. R. – Vishwa Prakashan – New Delhi 1990.
42. Research Methodology Practice – P. Philominathan – Shri A.V.V.M. Pushpam College – Poondi –Thanjavar
43. Rhoades, J.D., Kandiah, A. and Mashali, A.M. 1992. The use of saline waters for crop production. Irrigation and Drainage Paper 48. FAO, Rome, Italy.
44. Rubenstein, Amy S. (1986). An item-level analysis of questionnairetype measures of intellectual curiosity. Cornell University Ph. D. thesis.
45. Tiffen, M. 1989. Guidelines for the incorporation of health safeguards into irrigation projects through intersectoral cooperation. PEEM Guidelines Series 1. WHO, Geneva.

46. Todd, D.K. 1980. Groundwater Hydrology. John Wiley, London.
47. UN. 1994. Trends in EIA of Energy Projects. UN, New York, USA.
48. UNDP. 1992. Handbook and Guidelines for Environmental Management and Sustainable Development. UNDP, New York.
49. Wathern, P. (ed.). 1988. Environmental Impact Assessment: Theory and Practice. Routledge, London.
50. WHO. 1982. Manual on environmental management for mosquito control, with special emphasis on malaria vectors. Pub. No. 66. WHO, Geneva, Switzerland.
51. WHO. 1989. Health guidelines for the use of wastewater in Agriculture and Aquaculture. Report of a WHO Scientific Group. Technical Report Series No 778. WHO, Geneva, Switzerland.
52. WHO. 1993. Guidelines for Drinking Water Quality. Vol 1. Recommendations. WHO, Geneva, Switzerland.
53. World Bank. 1991. Operational Directive 4.01: Environmental Assessment. World Bank, Washington D.C., USA
54. World Bank. 1993. World Development Report - Investing in Health. Oxford University Press, Oxford, UK.
55. Worthington, E.B. 1977. Arid Lands Irrigation in Development Countries. Environmental Problems and Effects. Pergamon Press, Oxford, UK.
56. Wramner, P. 1989. Procedures for EIA of FAO's field projects. FAO, Rome, Italy.