

# SEVA BHARATI MAHAVIDYALAYA

## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General  
CBCS (Choice Based Credit System), Session: 2018-2019

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
I	Core-1( CIT: Geotectonics and Geomorphology)	Unit-1.1 Earth's tectonic and structural evolution with reference to geological time scale.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Earth's interior with special reference to seismology, Isostasy: Models of Airy and Pratt.	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.3 Plate Tectonics: Processes at constructive, conservative, destructive margins and hotspots; resulting landforms	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-1.4 Folds and Fault —Origin and types	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Degradational processes: Weathering, Mass wasting and resultant landforms	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Processes of entrainment, transportation and deposition by different geomorphic agents, Role of humans in landform development	Kishor Dandapat (KD)		1	1	HoD
		Unit-2.3 Development of river network and landforms on Uniclinal and folded structures	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.4 Landforms on igneous rocks with special reference to Granite and Basalt	Arpita Patra (AP)		1	1	HoD
		Unit-2.5 Karst landforms: Surface and sub-surface and landforms, Coastal processes and landforms	Subhankar Patra (SP)	1	3	3	HoD
		Unit-2.6 Glacial and fluvio-glacial processes and landforms; fluvio-glacial landforms	Chandan Karan (CK)		2	2	HoD
		Unit-2.7 Aeolian and fluvio-aeolian processes and landforms; fluvio-aeolian processes	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Models on landscape evolution: Views of Davis , Models on landscape evolution: Views of Penck, Models on landscape evolution: Views of Hack	Pranab Sahoo (PS)		2	2	HoD

### Reference Books:

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

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I	Core-2(C2T, Cartographic Techniques)	Unit-1.1 Maps: Classification and types. Components of a map	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Concept and application of scales: Plain, comparative, diagonal and vernier	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Coordinate systems: Polar and rectangular. Concept of geoid and spheroid	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Concept of generating globe. Grids: angular and linear systems of measurement	Subhankar Patra (SP)		2	2	HoD
		Unit-1.5 Bearing: Magnetic and true, whole-circle and reduced.	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.6 Map projections: Classification, properties and uses. Concept and significance of UTM projection.	Pranab Sahoo (PS)		1	1	HoD
		Unit-1.7 Basic concepts of surveying and survey equipment: Prismatic compass, dumpy level, theodolite, Abney level, clinometer.	Subhankar Patra (SP) Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.8 Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps	Chandan Karan (CK)		2	2	HoD
	Core-2(C2T, Cartographic Techniques Lab)	Unit-1.1 Graphical construction of scales: Plain, comparative, diagonal and vernier	Asish Ghosh (AG)	1	2	2	HoD
		Unit-.2 Construction of projections: Polar Zenithal Stereographic, Simple conic with two standard parallels, Bonne's, Cylindrical Equal Area, and Mercator's.	Pranab Sahoo (PS) Subhankar Patra (SP)		2	2	HoD
		Unit-1.3 Delineation of drainage basin from Survey of India topographical map. Construction and interpretation of relief profiles (superimposed, projected and composite), relative relief map, slope map (Wentworth), and stream ordering (Strahler) on a drainage basin.	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Correlation between physical and cultural features from Survey of India topographical maps. using transect chart	Chandan Karan (CK)		2	2	HoD

### Reference Books

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

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II	Core-3 (C3T: Human Geography)	Unit-1.1 Nature and scope and recent trends. Elements of Human Geography	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Approaches to the study of Human Geography; Resource, Locational, Landscape, Environmental	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Evolution of humans. Concept of race and ethnicity	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Space, society and cultural regions (language and religion)	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Evolution of human societies: Hunting and food gathering, pastoral nomadism, subsistence farming, industrial and urban societies	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Human adaptation to environment: Eskimo, Masai, Jarwa, Gaddi, Santhals.	Arpita Patra(AP)		1	1	HoD
		Unit-2.3 Population growth and distribution, population composition; demographic transition model	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Population-Resource regions (Ackerman)	Chandan Karan (CK)		1	1	HoD
		Unit-2.5 Human population and environment with special reference to development-environment conflict	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-2.6 Social morphology and rural house types in India	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Types and patterns of rural settlements	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Types and patterns of urban settlements	Kishor Dandapat (KD)		2	2	HoD

### Reference Books

- Bergman, E.F (1995): Human Geography-Culture, Connections and Landscape, Prentice Hall, New Jersey
- Chisholm. (1975): Human Geography, Penguin Books, Hermondsworth.
- Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.
- Johnston R; Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.
- Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York.
- Norton. W. (2001): Human Geography, 4th Edition Oxford University press, Oxford
- Pearce D. (1995): Tourism Today: A Geographical Analysis, 2nd edition, Longman Scientific & Technical, London
- Pickering K. and Owen A. A. (1997): An Introduction to Global Environmental Issues, 2nd edition Rutledge, London.
- Raw, M. (1986): Understanding Human Geography: A Practical Approach, Bell and Hyman. London
- Rubenstein, J.M. (2002), The Cultural Landscape, 7th edition, Prentice Hall, Englewood Cliffs
- Smith D M (1982): Human Geography: A Welfare Approach, Edward Arnold, London

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II	Core-4(C4T, Cartogram and Thematic Mapping)	Unit-1.1 Concepts of rounding, scientific notation, logarithm and anti-logarithm, natural and log scales	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Diagrammatic representation of data: Line, Bar, and Circle	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Representation of point data: Isoleths.	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-1.4 Representation of area data: Dots, proportional circles and Choropleth	Subhankar Patra (SP)		2	2	HoD
		Unit-1.5 Preparation and interpretation of large scale thematic maps: Geomorphological maps	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.6 Preparation and interpretation of large scale thematic maps: Climatological maps	Subhankar Patra (SP)		1	1	HoD
		Unit-1.7 Preparation and interpretation of large scale thematic maps: Landuse landcover maps	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.8 Preparation and interpretation of large scale thematic maps: Socio-economic maps	Chandan Karan (CK)		2	2	HoD
	Core-4(C4P, Cartography Lab)	Unit-1.1 Traverse survey using Prismatic Compass	Chandan Karan(CK)	1	2	2	HoD
		Unit-.2 Levelling by Dumpy Level and Prismatic Compass	Kishor Dandapat (KD) & Subhankar Patra(SP)		2	2	HoD
		Unit-1.3 Thematic maps: Proportional squares, pie diagrams with proportional circles, dots and spheres	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Thematic maps: Choropleth, isoline map, chorochromatic map	Arpita Patra(AP) & Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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III	Core-5( C5T: Climatology)	Unit-1.1 Nature, composition and layering of the atmosphere	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.2 Isolation: controlling factors. Heat budget of the atmosphere	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Temperature: horizontal and vertical distribution. Inversion of temperature: types, causes and consequences	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Greenhouse effect and importance of ozone layer	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Condensation: Process and forms. Mechanism of precipitation: Bergeron-Findeisen theory, collision and coalescence. Forms of precipitation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.2 Air mass: Typology, origin, characteristics and modification.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.3 Fronts: warm and cold; frontogenesis and frontolysis.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.4 Weather: stability and instability; barotropic and baroclinic conditions.	Chandan Karan (CK)		2	2	HoD
		Unit-2.5 Circulation in the atmosphere: Planetary winds, jet stream, index cycle	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.6 Tropical and mid-latitude cyclones	Kishor Dandapat (KD)		2	2	HoD
Unit-2.7 Monsoon circulation and mechanism with reference to India	Pranab Sahoo (PS)	1	2	2	HoD		
Unit-2.8 Climatic classification after Köppen, Thornthwaite and Oliver	Pranab Sahoo (PS) & Kishor Dandapat (KD)		2	2	HoD		

### Suggested Readings:

- Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
- Barry R. G. and Corley R. J., 1998: Atmosphere, Weather and Climate, Routledge, New York.
- Critchfield H. J., 1987: General Climatology, Prentice-Hall of India, New Delhi
- Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey.
- Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
- Trewartha G. T. and Horne L. H., 1980: An Introduction to Climate, McGraw

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III	Core-6(C6T, Statistical methods in Geography)	Unit-1.1 Importance and significance of Statistics in Geography. Discrete and continuous data, population and samples, scales of measurement (nominal, ordinal, interval and ratio), sources of data.	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.2 Collection of data and formation of statistical tables	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Sampling: Need, types, and significance and methods of random sampling	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Theoretical distribution: frequency, cumulative frequency, normal and probability	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Central tendency: Mean, median, mode, partition values	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Measures of dispersion range, mean deviation, standard deviation, coefficient of variation	Kishor Dandapat (KD)		1	1	HoD
		Unit-2.3 Association and correlation: Rank correlation, product moment correlation	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Regression (linear and non-linear ) and time series analysis (moving average)	Chandan Karan (CK)		2	2	HoD
	Core-6(C6P, Statistical methods in Geography Lab)	Unit-1.1 Construction of data matrix with each row representing an aerial unit (districts / blocks / <i>mouzas</i> / towns) and corresponding columns of relevant attributes.	Kishor Dandapat (KD)	1	1	1	HoD
		Unit-1.2 Based on the above, a frequency table, measures of central tendency and dispersion would be computed and interpreted.	Pranab Sahoo(PS)		1	1	HoD
		Unit-1.3 Histograms and frequency curve would be prepared on the dataset.	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 From the data matrix a sample set (20%) would be drawn using, random, systematic and stratified methods of sampling and locate the samples on a map with a short note on methods used.	Subhankar Patra (SP)		2	2	
		Unit-1.5 Based on of the sample set and using two relevant attributes, a scatter diagram and regression line would be plotted and residual from regression would be mapped with a short interpretation.	Chandan Karan (CK)		2	2	HoD

### Suggested Readings:

- Berry B. J. L. and Marble D. F. (eds.): Spatial Analysis – A Reader in Geography.
- Ebdon D., 1977: Statistics in Geography: A Practical Approach.
- Hammond P. and McCullagh P. S., 1978: Quantitative Techniques in Geography: An Introduction.
- King L. S., 1969: Statistical Analysis in Geography, Prentice-Hall.
- Mahmood A., 1977: Statistical Methods in Geographical Studies, Concept.
- Sarkar, A. (2013) Quantitative geography: techniques and presentations. Orient Black Swan Private Ltd., New Delhi
- Spiegel M. R.: Statistics, Schaum's Outline Series.

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III	Core-7( C7T:Geography of India)	Unit-1.1 Tectonic and stratigraphic provinces, physiographic divisions	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.2 Climate, soil and vegetation: Characteristics and classification	Arpita Patra(AP)		2	2	HoD
		Unit-1.3 Population: Distribution, growth, structure and policy	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Distribution of population by race, caste, religion, language, tribes and their correlates	Asish Ghosh (AG)		2	2	HoD
		Unit-1.5 Agricultural regions. Green revolution and its consequences	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.6 Mineral and power resources distribution and utilisation of iron ore, coal, petroleum, gas;	Chandan Karan (CK)		2	2	HoD
		Unit-1.7 Industrial development: Automobile and information technology	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.8 Regionalisation of India: Physiographic (R. L. Singh), Socio-cultural (Sopher) and Economic (Sengupta)	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Physical perspectives: Physiographic divisions, forest and water resources	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Population: Growth, distribution and human development	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Resources: Mining, agriculture and industries	Chandan Karan(CK)	1	2	2	HoD
		Unit-2.4 Regional Problem: Darjeeling Hills, Jangalmahal and Sundarban	Pranab Sahoo (PS)		2	2	HoD

### Suggested Readings:

- Deshpande C. D., 1992: India: A Regional Interpretation, ICSSR, New Delhi.
- Johnson, B. L. C., ed. 2001. Geographical Dictionary of India. Vision Books, New Delhi.
- Mandal R. B. (ed.), 1990: Patterns of Regional Geography – An International Perspective. Vol. 3 – Indian Perspective.
- Sdyasuk Galina and P Sengupta (1967): Economic Regionalisation of India, Census of India
- Sharma, T. C. 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi.
- Singh R. L., 1971: India: A Regional Geography, National Geographical Society of India.
- Singh, Jagdish 2003: India - A Comprehensive & Systematic Geography, Gyanodaya Prakashan, Gorakhpur.
- Spate O. H. K. and Learmonth A. T. A., 1967: India and Pakistan: A General and Regional Geography, Methuen.
- Tirtha, Ranjit 2002: Geography of India, Rawat Pubs., Jaipur & New Delhi.
- Pathak, C. R. 2003: Spatial Structure and Processes of Development in India. Regional Science Assoc., Kolkata.
- Tiwari, R.C. (2007) Geography of India. Prayag Pustak Bhawan, Allahabad
- Sharma, T.C. (2013) Economic Geography of India. Rawat Publication, Jaipur

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III	SEC-1 ( SEC-1T: Coastal Management)	Unit-1.1 Components of a coastal zone. Coastal morphodynamic variables and their role in evolution of coastal forms.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Environmental impacts and management of mining, oil exploration, salt manufacturing, land reclamation and tourism.	Chandan Karan(CK)		2	2	HoD
		Unit-1.3 Coastal hazards and their management using structural and non-structural measures: Erosion, flood, sand encroachment, dune degeneration, estuarine sedimentation and pollution	Kishor Dandapat(KD) & Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.4 Principles of Coastal Zone Management. Exclusive Economic Zone and Coastal Regulation Zones with reference to India.	Subhankar Patra(SP)		2	2	HoD

### Suggested Readings:

- Carter, R.W.G (1988): Coastal Environments: An Introduction to the Physical, Ecological and Cultural Systems of Coastlines, Academic Press, London
- Dayer K.R. (1979): Estuary Hydrography, and Sedimentation, Cambridge Univ. Press, Cambridge.
- Devis R.A. (ed) (1978): Coastal Sedimentary Environmental; Springer-Verlag, New York.
- Harikawa , K. (1978): Coastal Engineering, Univ Of Tokyo Press, Tokyo.
- Inman, D.L. (1960): Shore Processes, Encyclopedia of Science & Technology, Mc Graw Hill, New York.
- Knight, B. and Philip, A. (1979): Estuarine and coastal Land reclamation and water storage, Saxon House.
- Laussn, E and Lato, I.(ed): Chemistry and Biochemistry of estuaries, Wiley, New York.
- Pethick, J. (2000): An Introduction to coastal Geomorphology, Arnold, London.
- Stanley, D.J. and Suist D.J.P.(ed)(1976): Marine Sediment Transport and environmental management;Wiley, NewYork.
- Wagret,P. (1968): Polderlands, Methuen, London.

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IV	Core-8( C8T: Regional Planning and Development )	Unit-1.1 Concept of regions: Types of regions and their delineation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Types of planning, principles and objectives of regional planning, multi- level planning in India	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Tools and techniques of regional planning, need for regional planning in India	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Metropolitan concept: metropolitan areas, and urban agglomerations	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Development: Meaning, growth versus development	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Concept and strategies of regional development with reference to India	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.3 Theories and models for regional development : Growth pole model of perroux; growth centre model in Indian context	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Theories and models for regional development: Cumulative causation (Myrdal) and core periphery (Hirschman, Rostov and Friedman)	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.5 Changing concept of development, concept of underdevelopment; efficiency-equity debate	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.6 Indicators of development: Economic, social and environmental. Human development.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Regional development in India, regional inequality, disparity and diversity	Arpita Patra(AP)	1	2	2	HoD
Unit-2.8 Need and measures for balanced development in India	Arpita Patra (AP)	2	2		HoD		

### Reference Books

- Berry, B.J.L. and Horton, F.F. (1970): Geographic Perspectives on Urban Systems. Prentice Hall, New Jersey.
- Bhat L.S. (1972): Regional Planning In India, Statistical Publishing Society.
- Blij H. J. De, 1971: Geography: Regions and Concepts, John Wiley and Sons.
- Chand ,M and Puri V.K. ( 1983) : Regional planning In India , allied publishers , New Delhi
- Claval P.I, 1998: An Introduction to Regional Geography, Blackwell Publishers, Oxford and Massachusetts.
- Dickinson, R.E. (1964): City and Region, Rutledge, London.
- Friedmann J. and Alonso W. (1975): Regional Policy - Readings in Theory and Applications, MIT Press, Massachusetts.
- Gore C. G., 1984: Regions in Question: Space, Development Theory and Regional Policy, Methuen, London.
- Hall, P. (1992): Urban and Regional Planning, Routledge, London.
- Kulshetra ,S.K,( 2012) : Urban and Regional Planning in India : A hand book for Professional Practioners , Sage Publication , New Delhi

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IV	Core-9 (C9T:Economic Geography)	Unit-1.1 Meaning and approaches to Economic Geography, new Economic Geography.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Concepts in Economic Geography: Goods and services, production, exchange and consumption.	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Concept of economic man, theories of choices	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Economic distance and transport costs	Subhankar Patra (SP)		2	2	HoD
		Unit-2.1 Concept and classification of economic activities	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.2 Factors affecting location of economic activity with special reference to agriculture (Von Thunen), and industry (Weber).	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Primary activities: Subsistence and commercial agriculture, forestry, fishing and mining	Arpita Patra(AP)	1	2	2	HoD
		Unit-2.4 Secondary activities: Manufacturing (cotton textile, iron and steel), concept of manufacturing regions, special economic zones and technology parks	Chandan Karan(CK)		2	2	HoD
		Unit-2.5 Tertiary activities: transport, trade and services	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.6 Agricultural systems: Case studies of tea plantation in India and mixed farming in Europe	Asish Ghosh (AG)		2	2	HoD
		Unit-2.7 Transnational sea-routes, railways and highways with reference to India	Arpita Patra(AP)	1	2	2	HoD
		Unit-2.8 International agreements and trade blocs: GATT and OPEC	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
IV	Core-10 (C10T, Environmental Geography)	Unit-1.1 Geographers' approach to environmental studies	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.2 Perception of environment in different stages of civilization	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Concept of holistic environment and system approach	Arpita Patra(AP)	1	3	3	HoD
		Unit-1.4 Ecosystem: Concept, structure and functions	Chandan Karan (CK)		2	2	HoD
		Unit-2.5 Environmental pollution and degradation: Land, water and air	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.6 Space-time hierarchy of environmental problems: Local, regional and global	Chandan Karan (CK)		1	1	HoD
		Unit-1.7 Urban environmental issues with special reference to waste management	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.8 Environmental programmes and policies – Global, national and local levels	Pranab Sahoo(PS)		2	2	HoD
	Core-10 (C10P, Environmental Geography Lab)	Unit-1.1 Preparation of questionnaire for perception survey on environmental problems.	Kishor Dandapat (KD)	1	1	1	HoD
		Unit-1.2 Preparation of check-list for Environmental Impact Assessment of an urban / industrial project	Subhankar Patra (SP)		1	1	HoD
		Unit-1.3 Quality assessment of soil using field kit: pH and NPK	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Interpretation of air quality using CPCB / WBPCB data	Pranab Sahoo(PS)		2	2	HoD

### Reference Books

- Chandna R. C., 2002: Environmental Geography, Kalyani, Ludhiana.
- Cunningham W. P. and Cunningham M. A., 2004: Principals of Environmental Science: Inquiry and Applications, Tata Macgraw Hill, New Delhi.
- Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
- Singh, R.B. (Eds.) (2009) Biogeography and Biodiversity. Rawat Publication, Jaipur
- Miller G. T., 2004: Environmental Science: Working with the Earth, Thomson BrooksCole, Singapore.
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- Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1.
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IV	SEC-2 (SEC-2T: Research Method)	Unit-1.1 Geographic Enquiry: Definition and Ethics; Literature Review; Framing Research Questions, Objectives and Hypothesis; Preparing Sample Questionnaires and inventories	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Data Collection: Type and Sources of Data; Methods of data Collection; Data Input and Editing	Chandan Karan(CK)		2	2	HoD
		Unit-1.3 Data Analysis: Qualitative and Quantitative Analysis; Techniques Data Representation	Kishor Dandapat(KD)	1	2	2	HoD
		Unit-1.4 Structure of a Research Report: Preliminaries; Text; Citation, Notes, References, Bibliography and Abstract and Key words.	Subhankar Patra(SP)		2	2	HoD

### Reference Books

- ▶ Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- ▶ Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- ▶ Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- ▶ Misra, R.P. (2002) Research Methodology, Concept Publications, New Delhi.
- ▶ Mukherjee, Neela 1993. Participatory Rural Appraisal: Methodology and Application. Concept Pubs. Co., New Delhi.
- ▶ Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Pubs. Co., New Delhi
- ▶ Robinson A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.
- ▶ Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2 (2001).
- ▶ Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
- ▶ Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.
- ▶ Yadav, H. (2013) Shodh Pravidhi Evam Matratamak Bhugol, Raja Publications, Delhi

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V	Core-11( C11T: Field Work and Research Methodology)	Unit-1.1 Research in Geography: Meaning, types and significance, abstract and keywords	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Literature review and formulation of research design	Subhankar Patra (SP)		2	2	HoD
		Unit-1.3 Defining research problem, objectives and hypothesis. Research materials and methods	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Techniques of writing scientific reports: Preparing notes, references, bibliography	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Fieldwork in Geographical studies – Role and significance. Selection of study area and objectives. Pre-field preparations. Ethics of fieldwork	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Field techniques and tools: Observation (participant, non participant), questionnaires (open, closed, structured, non-structured). Interview with special reverence to focused group discussions.	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Positioning and collection of samples. Preparation of inventory from field data. Post-field tasks.	Subhankar Patra (SP)		2	2	HoD
	Core-11 ( C11P: Research Methodology and Field Work Lab)	1. Each student will prepare an individual report based on primary data collected from field survey and secondary data collected from different sources for either a rural area ( <i>mouza</i> ) or an urban area (municipal ward) based on cadastral or municipal maps to study specific problems. .2. The duration of the field work shall not exceed 10 days. 3. The report should be hand written in English on A4 size paper in candidate's own words within 5,000 to 8,000 words excluding figures , tables , photographs , maps , references and appendices. 4. A copy of the bound report, duly signed by the concerned teacher, should be submitted.	Pranab Sahoo(PS) Subhankar Patra (SP) Chandan Karan (CK) Kishor Dandapat (KD)	2	8	8	HoD

### Reference Books

- Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi
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- Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.

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V	Core-12 (C12T:Remote Sensing and GIS)	Unit-1.1 Principles of Remote Sensing (RS): Types of RS satellites and sensors	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.2 Sensor resolutions and their applications with reference to IRS and Landsat missions, image referencing schemes and data acquisition.	Arpita Patra (AP)		2	2	HoD
		Unit-1.3 Preparation of False Colour Composites from IRS LISS-3 and Landsat TM and OLI data.	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.4 Principles of image interpretation. Preparation of inventories of land use land cover (LULC) features from satellite images	Arpita Patra (AP)		2	2	HoD
		Unit-2.1 GIS data structures: types (spatial and non-spatial), raster and vector	Arpita Patra (AP)	1	2	2	HoD
		Unit-2.2 Principles of preparing attribute tables, data manipulation and overlay analysis	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Principles of GNSS positioning and waypoint collection	Arpita Patra (AP)	1	2	2	HoD
		Unit-2.4 Transferring of waypoints to GIS. Area and length calculations from GNSS data.	Arpita Patra (AP)		2	2	HoD
	Core-12 (C12P:Remote Sensing and GIS Lab)	Unit-1.1 Georeferencing of maps and images	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.2 Image enhancement. Preparation of reflectance libraries of LULC features across different image bands of IRS L3 or Landsat OLI data	Arpita Patra (AP)		2	2	HoD
		Unit-1.3 Image classification, post-classification analysis and class editing	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.4 Digitisation of features. Data attachment, overlay and preparation of thematic map	Arpita Patra (AP)		2	2	HoD

### Reference Books

- Campbell J. B., 2007: Introduction to Remote Sensing, Guildford Press.
- Jensen J. R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
- Joseph, G. 2005: Fundamentals of Remote Sensing, United Press India.
- Lillesand T. M., Kiefer R. W. and Chipman J. W., 2004: Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).
- Nag P. and Kudra, M., 1998: Digital Remote Sensing, Concept, New Delhi.
- Rees W. G., 2001: Physical Principles of Remote Sensing, Cambridge University Press.
- Singh R. B. and Murai S., 1998: Space-informatics for Sustainable Development, Oxford and IBH Pub.
- Sarkar, A. (2015) Practical geography:

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V	DSE-1 (DSE -1T: Hydrology and Oceanography )	Unit-1.1 Systems approach in hydrology. Global hydrological cycle: Its physical and biological role	Chandan Karan (CK)	1	2	2	HoD
		Unit-1..2Run off: controlling factors. Infiltration and evapotranspiration. Run off cycle	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.3 Drainage basin as a hydrological unit. Principles of water harvesting and watershed management	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.4 Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.1 Major relief features of the ocean floor: characteristics and origin according to plate tectonics.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2Physical and chemical properties of ocean water	Arpita Patra(AP)		2	2	HoD
		Unit-2.3Water mass, T-S diagram	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Air-Sea interactions, ocean circulation, wave and tide.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.5Ocean temperature and salinity : Distribution and determinants.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Coral reefs: Formation, classification and threats.	Asish Ghosh(AG)		2	2	HoD
		Unit-2.5 Marine resources: Classification and sustainable utilisation	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.6 . Sea level change: Types and cause	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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V	DSE-2 ( DSE -2T: Social Geography )	Unit-1.1 Social Geography: Concept, Origin, Nature and Scope	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1..2 Concept of Space, Social differentiation and stratification; social processes	Arpita Patra(AP) (AG)		2	2	HoD
		Unit-1.3 Social Categories: Caste, Class, Religion, Race and Gender and their Spatial distribution	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Basis of Social region formation; Evolution of social-cultural regions of India	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.5 Peopling Process of India: Technology and Occupational Change; Migration.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.6 Social groups, social behaviour	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Concept of Social Well-being, Quality of Life, Gender and Social Well-being	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Measures of Social Well-being: Healthcare, Education, Housing, Gender Disparity	Subhankar Patra (SP)		2	2	HoD
		Unit-2.3 Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime.	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Social Planning during the Five Year Plans in India	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.5 Social Policies in India: Education and Health	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.6 Social Impact Assessment (SIA): Concept and importance	Chandan Karan (CK)		2	2	HoD

### Reference Books

- ▶ Ahmed A., 1999: Social Geography, Rawat Publications.
- ▶ Casino V. J. D., Jr., 2009) Social Geography: A Critical Introduction, Wiley Blackwell.
- ▶ Cater J. and Jones T., 2000: Social Geography: An Introduction to Contemporary Issues, Hodder Arnold.
- ▶ Holt L., 2011: Geographies of Children, Youth and Families: An International Perspective, Taylor & Francis.
- ▶ Panelli R., 2004: Social Geographies: From Difference to Action, Sage.
- ▶ Smith D. M., 1977: Human geography: A Welfare Approach, Edward Arnold, and London.
- ▶ Smith D. M., 1994: Geography and Social Justice, Blackwell, Oxford.
- ▶ Smith S. J., Pain R., Marston S. A., Jones J. P., 2009: The SAGE Handbook of Social Geographies, Sage Publications.

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V	DSE-2 (DSE -2T: Resource Geography)	Unit-1.1 Natural Resources: Concept and classification	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.2 Approaches to Resource Utilization: Utilitarian, Conservational, Community based adaptive	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Significance of Resources: Backbone of Economic growth and development	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Pressure on resources. Appraisal and Conservation on Natural Resources	Chandan Karan (CK)		2	2	HoD
		Unit-1.5 Problems of resource depletion—global scenario (forest, water, fossil fuels).	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.6 Sustainable Resource Development	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Distribution, Utilisation, Problems and Management of Metallic Mineral Resources: Iron ore, Bauxite, copper	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.2 Distribution, Utilisation, Problems and Management of Non-Metallic Mineral Resources: Limestone, Mica, Gypsum	Asish Ghosh (AG)		2	2	HoD
		Unit-2.3 Distribution, Utilisation, Problems and Management of Energy Resources: Conventional and Non-Conventional	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.4 Contemporary Energy Crisis and Future Scenario	Chandan Karan (CK)		2	2	HoD
		Unit-2.5. Politics of Power resources	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Limits to Growth and Sustainable Use of Resources; Concept of Resource sharing	Kishor Dandapat (KD)		2	2	HoD

### Reference Books

- ▶ Cutter S. N., Renwick H. L. and Renwick W., 1991: Exploitation, Conservation, And Preservation: A Geographical Perspective on Natural Resources Use, John Wiley and Sons, New York.
- ▶ Gadgil M. and Guha R., 2005: The Use and Abuse of Nature: Incorporating This Fissured Land: An Ecological History of India and Ecology and Equity, Oxford University Press. USA.
- ▶ Holechek J. L. C., Richard A., Fisher J. T. and Valdez R., 2003: Natural Resources: Ecology, Economics and Policy, Prentice Hall, New Jersey.
- ▶ Jones G. and Hollier G., 1997: Resources, Society and Environmental Management, Paul Chapman, London.
- ▶ Klee G., 1991: Conservation of Natural Resources, Prentice Hall, Englewood.
- ▶ Mather A. S. and Chapman K., 1995: Environmental Resources, John Wiley and Sons, New York.
- ▶ Mitchell B., 1997: Resource and Environmental Management, Longman Harlow, England.
- ▶ Owen S. and Owen P. L., 1991: Environment, Resources and Conservation, Cambridge University Press, New York.
- ▶ Rees J., 1990: Natural Resources: Allocation, Economics and Policy, Routledge, London

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VI	Core-13( C13T: Evolution of Geographical Thought )	Unit-1.1 Development of Geography and contributions of Greek, Chinese, and Indian geographers.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Impact of 'Dark Age' on Geography and Arab contributions	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Geography during the Age of 'Discovery' and 'Exploration' (Contributions of Portuguese Voyages, Columbus, Vasco da Gama, Magellan, Thomas Cook)	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Transition from Cosmography to Scientific Geography (Contributions of Bernard Varenius and Immanuel Kant); Dualism and Dichotomies (General vs. Particular, Physical vs. Human, Regional vs. Systematic, Determinism vs. Possibilism, Ideographic vs. Nomeothetic)	Kishor Dandapat (KD) Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Evolution of Geographical thoughts in Germany, France, Britain and United States of America.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Contributions of Humboldt and Ritter	Arpita Patra (AP)		2	2	HoD
		Unit-2.3 Contributions of Richthofen, Hettner and Ratzel	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Schools of geographical thought: French, British and American;	Asish Ghosh (AG)		2	2	HoD
		Unit-2.5 Trends of Geography in the post World War-II period	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Evolution of Geography in India: formative periods, establishments and emerging trends	Arpita Patra (AP)		2	2	HoD
Unit-2.7 Quantitative Revolution and its impact, behaviouralism, systems approach, radicalism, feminism	Kishor Dandapat (KD)	1	2	2	HoD		
Unit-2.8 Towards Post Modernism: Changing concept of space in geography. Geography in the 21st Century	Pranab Sahoo (PS)		2	2	HoD		

### Reference Books:

- ▶ Arentsen M., Stam R. and Thuijss R., 2000: Post-modern Approaches to Space, ebook.
- ▶ Bhat, L.S. (2009) Geography in India (Selected Themes). Pearson
- ▶ Bonnett A., 2008: What is Geography? Sage.
- ▶ Dikshit R. D., 1997: Geographical Thought: A Contextual History of Ideas, Prentice- Hall India.
- ▶ Hartshone R., 1959: Perspectives of Nature of Geography, Rand MacNally and Co.
- ▶ Holt-Jensen A., 2011: Geography: History and Its Concepts: A Students Guide, SAGE.
- ▶ Johnston R. J., (Ed.): Dictionary of Human Geography, Routledge.

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VI	Core-14 (C14T:Disaster Management)	Unit-1.1 Classification of hazards and disasters.	Pranab Sahoo(PS)	1	2	2	HoD
		Unit-1.2 Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms.	Kishor Dandapat(KD)		2	2	HoD
		Unit-1.3 Responses to hazards: Preparedness, trauma and aftermath. Resilience and capacity building.	Chandan Karan(CK)	1	2	2	HoD
		Unit-1.4 Hazards mapping: Data and techniques.	Subhankar Patra(SP)		2	2	HoD
		Unit-2.1 Earthquake: Factors, vulnerability, consequences and management	Subhankar Patra(SP)	1	2	2	HoD
		Unit-2.2 Landslide: Factors, vulnerability, consequences and management	Asish Ghosh(AG)		2	2	HoD
		Unit-2.3 Cyclone: Factors, vulnerability, consequences and management	Pranab Sahoo(PS)	1	2	2	HoD
		Unit-2.4 Fire: Factors, vulnerability, consequences and management	Arpita Patra (AP)		2	2	HoD
	Core-14 (C14P: Disaster Management based Project Work	An individual Project Report based on any one case study among the following disasters incorporating a preparedness plan in the vicinity of the candidate's institution or residence: 1. Thunderstorm 2. Landslide 3. Flood 4. Coastal / riverbank erosion 5. Fire 6. Industrial accident 7. Structural collapse	Pranab Sahoo(PS), Subhankar Patra(SP), Chandan Karan(CK), Kishor Dandapat(KD)	2	8	8	HoD

### Reference Books

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

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CBCS (Choice Based Credit System), Session: 2018-2019

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical( L -T-P)	Hours	Approved
VI	DSE-3 ( DSE -3T: Soil and Biogeography )	Unit-1.1 Factors of soil formation. Man as an active agent of soil transformation.	Asish Ghosh(AG)	1	2	2	HoD
		Unit-1.2 Soil profile. Origin and profile characteristics of Lateritic, Podzol and Chernozem soils	Asish Ghosh(AG)		2	2	HoD
		Unit-1.3 Definition and significance of soil properties: Texture, structure and moisture,	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Definition and significance of soil properties: p <sup>H</sup> , organic matter and NPK	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.5 Soil erosion and degradation: Factors, processes and mitigation measures	Pranab Sahoo (PS)	1	2	2	HoD
		Unit- 1.6 Principles of soil classification: Genetic and USDA. Concept of land capability and its classification	Subhankar Patra (SP)		2	2	HoD
		Unit-1.7 Concepts of biosphere, ecosystem, biome, ecotone, community and ecology	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.8 Concepts of trophic structure, food chain and food web. Energy flow in ecosystems	Chandan Karan (CK)		2	2	HoD
		Unit- 1.9 Geographical extent and characteristic features of: Tropical rain forest, Taiga and Grassland biomes	Subhankar Patra (SP)	1	2	2	HoD
		Unit- 1.10 Bio-geochemical cycles with special reference to carbon dioxide and nitrogen	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.11 Deforestation: Causes, consequences and management	Arpita Patra(AP)	1	2	2	HoD
		Unit- 1.12 Bio-diversity: Definition, types, threats and conservation measures	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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CBCS (Choice Based Credit System), Session: 2018-2019

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VI	DSE-4 ( DSE -4T: Agricultural Geography )	Unit-1.1 Progress of Agricultural Geography with reference to allied disciplines. Approaches to study of Agricultural Geography.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Origin and dispersal of agriculture; Role of agriculture on human society.	Pranab Sahoo (PS)		2	2	HoD
		Unit-1. Factors affecting agriculture. Classification of world agricultural systems.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Location and characteristics of major agricultural types: Intensive subsistence, extensive commercial and plantation agriculture.	Arpita Patra(AP)		2	2	HoD
		Unit-2.1 Concept of cropping pattern, crop combination, gross and net cropped area, crop rotation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.2 A critical review and contemporary perspective of Von Thunen' model	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Definition and factors affecting yield. Measures of agricultural productivity	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Role of irrigation in Indian agriculture	Asish Ghosh (AG)		2	2	HoD
		Unit-2.5 Problems of agriculture with special reference to South Asian countries	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 World patterns of agricultural production and food security	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Land use survey and land classification (USDA)	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Globalization and agriculture with special reference to India	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

- ▶ Basu, D.N., and Guha, G.S., 1996: Agro-Climatic Regional Planning in India, Vol.I & II, Concept Publication, New Delhi.
- ▶ Bryant, C.R., Johnston, T.R, 1992: Agriculture in the City Countryside, Belhaven Press, London.
- ▶ Burger, A., 1994: Agriculture of the World, Aldershot, Avebury.
- ▶ Grigg, D.B., 1984: Introduction to Agricultural Geography, Hutchinson, London.
- ▶ Ilbery B. W., 1985: Agricultural Geography: A Social and Economic Analysis, Oxford University Press.
- ▶ Mohammad, N., 1992: New Dimension in Agriculture Geography, Vol. I to VIII, Concept Pub., New Delhi.
- ▶ Roling, N.G., and Wageruters, M.A.E.,(ed.) 1998: Facilitating Sustainable Agriculture, Cambridge University Press, Cambridge.
- ▶ Shafi, M., 2006: Agricultural Geography, Doring Kindersley India Pvt. Ltd., New Delhi
- ▶ Singh, J., and Dhillon, S.S., 1984: Agricultural Geography, Tata McGraw Hill, New Delhi.
- ▶ Tarrant J. R., 1973: Agricultural Geography, David and Charles, Devon.

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I	Core-1( CIT: Geotectonics and Geomorphology)	Unit-1.1 Earth's tectonic and structural evolution with reference to geological time scale.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Earth's interior with special reference to seismology, Isostasy: Models of Airy and Pratt.	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.3 Plate Tectonics: Processes at constructive, conservative, destructive margins and hotspots; resulting landforms	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-1.4 Folds and Fault —Origin and types	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Degradational processes: Weathering, Mass wasting and resultant landforms	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Processes of entrainment, transportation and deposition by different geomorphic agents, Role of humans in landform development	Kishor Dandapat (KD)		1	1	HoD
		Unit-2.3 Development of river network and landforms on Uniclinal and folded structures	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.4 Landforms on igneous rocks with special reference to Granite and Basalt	Arpita Patra (AP)		1	1	HoD
		Unit-2.5 Karst landforms: Surface and sub-surface and landforms, Coastal processes and landforms	Subhankar Patra (SP)	1	3	3	HoD
		Unit-2.6 Glacial and fluvio-glacial processes and landforms; fluvio-glacial landforms	Chandan Karan (CK)		2	2	HoD
		Unit-2.7 Aeolian and fluvio-aeolian processes and landforms; fluvio-aeolian processes	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Models on landscape evolution: Views of Davis , Models on landscape evolution: Views of Penck, Models on landscape evolution: Views of Hack	Pranab Sahoo (PS)		2	2	HoD

### Reference Books:

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

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I	Core-2(C2T, Cartographic Techniques)	Unit-1.1 Maps: Classification and types. Components of a map	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Concept and application of scales: Plain, comparative, diagonal and vernier	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Coordinate systems: Polar and rectangular. Concept of geoid and spheroid	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Concept of generating globe. Grids: angular and linear systems of measurement	Subhankar Patra (SP)		2	2	HoD
		Unit-1.5 Bearing: Magnetic and true, whole-circle and reduced.	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.6 Map projections: Classification, properties and uses. Concept and significance of UTM projection.	Pranab Sahoo (PS)		1	1	HoD
		Unit-1.7 Basic concepts of surveying and survey equipment: Prismatic compass, dumpy level, theodolite, Abney level, clinometer.	Subhankar Patra (SP) Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.8 Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps	Chandan Karan (CK)		2	2	HoD
	Core-2(C2T, Cartographic Techniques Lab)	Unit-1.1 Graphical construction of scales: Plain, comparative, diagonal and vernier	Asish Ghosh (AG)	1	2	2	HoD
		Unit-.2 Construction of projections: Polar Zenithal Stereographic, Simple conic with two standard parallels, Bonne's, Cylindrical Equal Area, and Mercator's.	Pranab Sahoo (PS) Subhankar Patra (SP)		2	2	HoD
		Unit-1.3 Delineation of drainage basin from Survey of India topographical map. Construction and interpretation of relief profiles (superimposed, projected and composite), relative relief map, slope map (Wentworth), and stream ordering (Strahler) on a drainage basin.	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Correlation between physical and cultural features from Survey of India topographical maps. using transect chart	Chandan Karan (CK)		2	2	HoD

### Reference Books

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

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Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
II	Core-3 (C3T: Human Geography)	Unit-1.1 Nature and scope and recent trends. Elements of Human Geography	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Approaches to the study of Human Geography; Resource, Locational, Landscape, Environmental	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Evolution of humans. Concept of race and ethnicity	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Space, society and cultural regions (language and religion)	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Evolution of human societies: Hunting and food gathering, pastoral nomadism, subsistence farming, industrial and urban societies	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Human adaptation to environment: Eskimo, Masai, Jarwa, Gaddi, Santhals.	Arpita Patra(AP)		1	1	HoD
		Unit-2.3 Population growth and distribution, population composition; demographic transition model	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Population-Resource regions (Ackerman)	Chandan Karan (CK)		1	1	HoD
		Unit-2.5 Human population and environment with special reference to development-environment conflict	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-2.6 Social morphology and rural house types in India	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Types and patterns of rural settlements	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Types and patterns of urban settlements	Kishor Dandapat (KD)		2	2	HoD

### Reference Books

- Bergman, E.F (1995): Human Geography-Culture, Connections and Landscape, Prentice Hall, New Jersey
- Chisholm. (1975): Human Geography, Penguin Books, Hermondsworth.
- Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.
- Johnston R; Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.
- Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York.
- Norton. W. (2001): Human Geography, 4th Edition Oxford University press, Oxford
- Pearce D. (1995): Tourism Today: A Geographical Analysis, 2nd edition, Longman Scientific & Technical, London
- Pickering K. and Owen A. A. (1997): An Introduction to Global Environmental Issues, 2nd edition Rutledge, London.
- Raw, M. (1986): Understanding Human Geography: A Practical Approach, Bell and Hyman. London
- Rubenstein, J.M. (2002), The Cultural Landscape, 7th edition, Prentice Hall, Englewood Cliffs
- Smith D M (1982): Human Geography: A Welfare Approach, Edward Arnold, London

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2019-2020

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
II	Core-4(C4T, Cartogram and Thematic Mapping)	Unit-1.1 Concepts of rounding, scientific notation, logarithm and anti-logarithm, natural and log scales	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Diagrammatic representation of data: Line, Bar, and Circle	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Representation of point data: Isoleths.	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-1.4 Representation of area data: Dots, proportional circles and Choropleth	Subhankar Patra (SP)		2	2	HoD
		Unit-1.5 Preparation and interpretation of large scale thematic maps: Geomorphological maps	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.6 Preparation and interpretation of large scale thematic maps: Climatological maps	Subhankar Patra (SP)		1	1	HoD
		Unit-1.7 Preparation and interpretation of large scale thematic maps: Landuse landcover maps	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.8 Preparation and interpretation of large scale thematic maps: Socio-economic maps	Chandan Karan (CK)		2	2	HoD
	Core-4(C4P, Cartography Lab)	Unit-1.1 Traverse survey using Prismatic Compass	Chandan Karan(CK)	1	2	2	HoD
		Unit-.2 Levelling by Dumpy Level and Prismatic Compass	Kishor Dandapat (KD) & Subhankar Patra(SP)		2	2	HoD
		Unit-1.3 Thematic maps: Proportional squares, pie diagrams with proportional circles, dots and spheres	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Thematic maps: Choropleth, isoline map, chorochromatic map	Arpita Patra(AP) & Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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Department of Geography, B.Sc. Honours/General

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III	Core-5( C5T: Climatology)	Unit-1.1 Nature, composition and layering of the atmosphere	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.2 Isolation: controlling factors. Heat budget of the atmosphere	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Temperature: horizontal and vertical distribution. Inversion of temperature: types, causes and consequences	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Greenhouse effect and importance of ozone layer	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Condensation: Process and forms. Mechanism of precipitation: Bergeron-Findeisen theory, collision and coalescence. Forms of precipitation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.2 Air mass: Typology, origin, characteristics and modification.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.3 Fronts: warm and cold; frontogenesis and frontolysis.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.4 Weather: stability and instability; barotropic and baroclinic conditions.	Chandan Karan (CK)		2	2	HoD
		Unit-2.5 Circulation in the atmosphere: Planetary winds, jet stream, index cycle	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.6 Tropical and mid-latitude cyclones	Kishor Dandapat (KD)		2	2	HoD
Unit-2.7 Monsoon circulation and mechanism with reference to India	Pranab Sahoo (PS)	1	2	2	HoD		
Unit-2.8 Climatic classification after Köppen, Thornthwaite and Oliver	Pranab Sahoo (PS) & Kishor Dandapat (KD)		2	2	HoD		

### Suggested Readings:

- Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
- Barry R. G. and Corley R. J., 1998: Atmosphere, Weather and Climate, Routledge, New York.
- Critchfield H. J., 1987: General Climatology, Prentice-Hall of India, New Delhi
- Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey.
- Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
- Trewartha G. T. and Horne L. H., 1980: An Introduction to Climate, McGraw

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III	Core-6(C6T, Statistical methods in Geography)	Unit-1.1 Importance and significance of Statistics in Geography. Discrete and continuous data, population and samples, scales of measurement (nominal, ordinal, interval and ratio), sources of data.	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.2 Collection of data and formation of statistical tables	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Sampling: Need, types, and significance and methods of random sampling	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Theoretical distribution: frequency, cumulative frequency, normal and probability	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Central tendency: Mean, median, mode, partition values	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Measures of dispersion range, mean deviation, standard deviation, coefficient of variation	Kishor Dandapat (KD)		1	1	HoD
		Unit-2.3 Association and correlation: Rank correlation, product moment correlation	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Regression (linear and non-linear ) and time series analysis (moving average)	Chandan Karan (CK)		2	2	HoD
	Core-6(C6P, Statistical methods in Geography Lab)	Unit-1.1 Construction of data matrix with each row representing an aerial unit (districts / blocks / <i>mouzas</i> / towns) and corresponding columns of relevant attributes.	Kishor Dandapat (KD)	1	1	1	HoD
		Unit-1.2 Based on the above, a frequency table, measures of central tendency and dispersion would be computed and interpreted.	Pranab Sahoo(PS)		1	1	HoD
		Unit-1.3 Histograms and frequency curve would be prepared on the dataset.	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 From the data matrix a sample set (20%) would be drawn using, random, systematic and stratified methods of sampling and locate the samples on a map with a short note on methods used.	Subhankar Patra (SP)		2	2	
		Unit-1.5 Based on of the sample set and using two relevant attributes, a scatter diagram and regression line would be plotted and residual from regression would be mapped with a short interpretation.	Chandan Karan (CK)		2	2	HoD

### Suggested Readings:

- Berry B. J. L. and Marble D. F. (eds.): Spatial Analysis – A Reader in Geography.
- Ebdon D., 1977: Statistics in Geography: A Practical Approach.
- Hammond P. and McCullagh P. S., 1978: Quantitative Techniques in Geography: An Introduction.
- King L. S., 1969: Statistical Analysis in Geography, Prentice-Hall.
- Mahmood A., 1977: Statistical Methods in Geographical Studies, Concept.
- Sarkar, A. (2013) Quantitative geography: techniques and presentations. Orient Black Swan Private Ltd., New Delhi
- Spiegel M. R.: Statistics, Schaum's Outline Series.

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Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
III	Core-7( C7T:Geography of India)	Unit-1.1 Tectonic and stratigraphic provinces, physiographic divisions	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.2 Climate, soil and vegetation: Characteristics and classification	Arpita Patra(AP)		2	2	HoD
		Unit-1.3 Population: Distribution, growth, structure and policy	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Distribution of population by race, caste, religion, language, tribes and their correlates	Asish Ghosh (AG)		2	2	HoD
		Unit-1.5 Agricultural regions. Green revolution and its consequences	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.6 Mineral and power resources distribution and utilisation of iron ore, coal, petroleum, gas;	Chandan Karan (CK)		2	2	HoD
		Unit-1.7 Industrial development: Automobile and information technology	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.8 Regionalisation of India: Physiographic (R. L. Singh), Socio-cultural (Sopher) and Economic (Sengupta)	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Physical perspectives: Physiographic divisions, forest and water resources	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Population: Growth, distribution and human development	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Resources: Mining, agriculture and industries	Chandan Karan(CK)	1	2	2	HoD
		Unit-2.4 Regional Problem: Darjeeling Hills, Jangalmahal and Sundarban	Pranab Sahoo (PS)		2	2	HoD

### Suggested Readings:

- Deshpande C. D., 1992: India: A Regional Interpretation, ICSSR, New Delhi.
- Johnson, B. L. C., ed. 2001. Geographical Dictionary of India. Vision Books, New Delhi.
- Mandal R. B. (ed.), 1990: Patterns of Regional Geography – An International Perspective. Vol. 3 – Indian Perspective.
- Sdyasuk Galina and P Sengupta (1967): Economic Regionalisation of India, Census of India
- Sharma, T. C. 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi.
- Singh R. L., 1971: India: A Regional Geography, National Geographical Society of India.
- Singh, Jagdish 2003: India - A Comprehensive & Systematic Geography, Gyanodaya Prakashan, Gorakhpur.
- Spate O. H. K. and Learmonth A. T. A., 1967: India and Pakistan: A General and Regional Geography, Methuen.
- Tirtha, Ranjit 2002: Geography of India, Rawat Pubs., Jaipur & New Delhi.
- Pathak, C. R. 2003: Spatial Structure and Processes of Development in India. Regional Science Assoc., Kolkata.
- Tiwari, R.C. (2007) Geography of India. Prayag Pustak Bhawan, Allahabad
- Sharma, T.C. (2013) Economic Geography of India. Rawat Publication, Jaipur

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Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical(L-T-P)	Hours	Approved
III	SEC-1 ( SEC-1T: Coastal Management)	Unit-1.1 Components of a coastal zone. Coastal morphodynamic variables and their role in evolution of coastal forms.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Environmental impacts and management of mining, oil exploration, salt manufacturing, land reclamation and tourism.	Chandan Karan(CK)		2	2	HoD
		Unit-1.3 Coastal hazards and their management using structural and non-structural measures: Erosion, flood, sand encroachment, dune degeneration, estuarine sedimentation and pollution	Kishor Dandapat(KD) & Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.4 Principles of Coastal Zone Management. Exclusive Economic Zone and Coastal Regulation Zones with reference to India.	Subhankar Patra(SP)		2	2	HoD

### Suggested Readings:

- Carter, R.W.G (1988): Coastal Environments: An Introduction to the Physical, Ecological and Cultural Systems of Coastlines, Academic Press, London
- Dayer K.R. (1979): Estuary Hydrography, and Sedimentation, Cambridge Univ. Press, Cambridge.
- Devis R.A. (ed) (1978): Coastal Sedimentary Environmental; Springer-Verlag, New York.
- Harikawa , K. (1978): Coastal Engineering, Univ Of Tokyo Press, Tokyo.
- Inman, D.L. (1960): Shore Processes, Encyclopedia of Science & Technology, Mc Graw Hill, New York.
- Knight, B. and Philip, A. (1979): Estuarine and coastal Land reclamation and water storage, Saxon House.
- Laussn, E and Lato, I.(ed): Chemistry and Biochemistry of estuaries, Wiley, New York.
- Pethick, J. (2000): An Introduction to coastal Geomorphology, Arnold, London.
- Stanley, D.J. and Suist D.J.P.(ed)(1976): Marine Sediment Transport and environmental management;Wiley, NewYork.
- Wagret,P. (1968): Polderlands, Methuen, London.

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IV	Core-8( C8T: Regional Planning and Development )	Unit-1.1 Concept of regions: Types of regions and their delineation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Types of planning, principles and objectives of regional planning, multi- level planning in India	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Tools and techniques of regional planning, need for regional planning in India	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Metropolitan concept: metropolitan areas, and urban agglomerations	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Development: Meaning, growth versus development	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Concept and strategies of regional development with reference to India	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.3 Theories and models for regional development : Growth pole model of perroux; growth centre model in Indian context	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Theories and models for regional development: Cumulative causation (Myrdal) and core periphery (Hirschman, Rostov and Friedman)	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.5 Changing concept of development, concept of underdevelopment; efficiency-equity debate	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.6 Indicators of development: Economic, social and environmental. Human development.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Regional development in India, regional inequality, disparity and diversity	Arpita Patra(AP)	1	2	2	HoD
Unit-2.8 Need and measures for balanced development in India	Arpita Patra (AP)	2	2		HoD		

### Reference Books

- Berry, B.J.L. and Horton, F.F. (1970): Geographic Perspectives on Urban Systems. Prentice Hall, New Jersey.
- Bhat L.S. (1972): Regional Planning In India, Statistical Publishing Society.
- Blij H. J. De, 1971: Geography: Regions and Concepts, John Wiley and Sons.
- Chand ,M and Puri V.K. ( 1983) : Regional planning In India , allied publishers , New Delhi
- Claval P.I, 1998: An Introduction to Regional Geography, Blackwell Publishers, Oxford and Massachusetts.
- Dickinson, R.E. (1964): City and Region, Rutledge, London.
- Friedmann J. and Alonso W. (1975): Regional Policy - Readings in Theory and Applications, MIT Press, Massachusetts.
- Gore C. G., 1984: Regions in Question: Space, Development Theory and Regional Policy, Methuen, London.
- Hall, P. (1992): Urban and Regional Planning, Routledge, London.
- Kulshetra ,S.K,( 2012) : Urban and Regional Planning in India : A hand book for Professional Practioners , Sage Publication , New Delhi

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IV	Core-9 (C9T:Economic Geography)	Unit-1.1 Meaning and approaches to Economic Geography, new Economic Geography.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Concepts in Economic Geography: Goods and services, production, exchange and consumption.	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Concept of economic man, theories of choices	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Economic distance and transport costs	Subhankar Patra (SP)		2	2	HoD
		Unit-2.1 Concept and classification of economic activities	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.2 Factors affecting location of economic activity with special reference to agriculture (Von Thunen), and industry (Weber).	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Primary activities: Subsistence and commercial agriculture, forestry, fishing and mining	Arpita Patra(AP)	1	2	2	HoD
		Unit-2.4 Secondary activities: Manufacturing (cotton textile, iron and steel), concept of manufacturing regions, special economic zones and technology parks	Chandan Karan(CK)		2	2	HoD
		Unit-2.5 Tertiary activities: transport, trade and services	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.6 Agricultural systems: Case studies of tea plantation in India and mixed farming in Europe	Asish Ghosh (AG)		2	2	HoD
		Unit-2.7 Transnational sea-routes, railways and highways with reference to India	Arpita Patra(AP)	1	2	2	HoD
		Unit-2.8 International agreements and trade blocs: GATT and OPEC	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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IV	Core-10 (C10T, Environmental Geography)	Unit-1.1 Geographers' approach to environmental studies	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.2 Perception of environment in different stages of civilization	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Concept of holistic environment and system approach	Arpita Patra(AP)	1	3	3	HoD
		Unit-1.4 Ecosystem: Concept, structure and functions	Chandan Karan (CK)		2	2	HoD
		Unit-2.5 Environmental pollution and degradation: Land, water and air	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.6 Space-time hierarchy of environmental problems: Local, regional and global	Chandan Karan (CK)		1	1	HoD
		Unit-1.7 Urban environmental issues with special reference to waste management	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.8 Environmental programmes and policies – Global, national and local levels	Pranab Sahoo(PS)		2	2	HoD
	Core-10 (C10P, Environmental Geography Lab)	Unit-1.1 Preparation of questionnaire for perception survey on environmental problems.	Kishor Dandapat (KD)	1	1	1	HoD
		Unit-1.2 Preparation of check-list for Environmental Impact Assessment of an urban / industrial project	Subhankar Patra (SP)		1	1	HoD
		Unit-1.3 Quality assessment of soil using field kit: pH and NPK	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Interpretation of air quality using CPCB / WBPCB data	Pranab Sahoo(PS)		2	2	HoD

### Reference Books

- Chandna R. C., 2002: Environmental Geography, Kalyani, Ludhiana.
- Cunningham W. P. and Cunningham M. A., 2004: Principals of Environmental Science: Inquiry and Applications, Tata Macgraw Hill, New Delhi.
- Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
- Singh, R.B. (Eds.) (2009) Biogeography and Biodiversity. Rawat Publication, Jaipur
- Miller G. T., 2004: Environmental Science: Working with the Earth, Thomson BrooksCole, Singapore.
- MoEF, 2006: National Environmental Policy-2006, Ministry of Environment and Forests, Government of India.
- Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India.
- Odum, E. P. et al, 2005: Fundamentals of Ecology, Ceneage Learning India.
- Singh S., 1997: Environmental Geography, Prayag Pustak Bhawan. Allahabad.
- UNEP, 2007: Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme.
- Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1.
- Singh, R.B. (1998) Ecological Techniques and Approaches to Vulnerable Environment, New Delhi, Oxford & IBH Pub.

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2019-2020

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IV	SEC-2 (SEC-2T: Research Method)	Unit-1.1 Geographic Enquiry: Definition and Ethics; Literature Review; Framing Research Questions, Objectives and Hypothesis; Preparing Sample Questionnaires and inventories	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Data Collection: Type and Sources of Data; Methods of data Collection; Data Input and Editing	Chandan Karan(CK)		2	2	HoD
		Unit-1.3 Data Analysis: Qualitative and Quantitative Analysis; Techniques Data Representation	Kishor Dandapat(KD)	1	2	2	HoD
		Unit-1.4 Structure of a Research Report: Preliminaries; Text; Citation, Notes, References, Bibliography and Abstract and Key words.	Subhankar Patra(SP)		2	2	HoD

### Reference Books

- ▶ Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- ▶ Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- ▶ Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- ▶ Misra, R.P. (2002) Research Methodology, Concept Publications, New Delhi.
- ▶ Mukherjee, Neela 1993. Participatory Rural Appraisal: Methodology and Application. Concept Pubs. Co., New Delhi.
- ▶ Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Pubs. Co., New Delhi
- ▶ Robinson A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.
- ▶ Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2 (2001).
- ▶ Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
- ▶ Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.
- ▶ Yadav, H. (2013) Shodh Pravidhi Evam Matratamak Bhugol, Raja Publications, Delhi

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Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
V	Core-11( C11T: Field Work and Research Methodology)	Unit-1.1 Research in Geography: Meaning, types and significance, abstract and keywords	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Literature review and formulation of research design	Subhankar Patra (SP)		2	2	HoD
		Unit-1.3 Defining research problem, objectives and hypothesis. Research materials and methods	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Techniques of writing scientific reports: Preparing notes, references, bibliography	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Fieldwork in Geographical studies – Role and significance. Selection of study area and objectives. Pre-field preparations. Ethics of fieldwork	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Field techniques and tools: Observation (participant, non participant), questionnaires (open, closed, structured, non-structured). Interview with special reverence to focused group discussions.	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Positioning and collection of samples. Preparation of inventory from field data. Post-field tasks.	Subhankar Patra (SP)		2	2	HoD
	Core-11 ( C11P: Research Methodology and Field Work Lab)	1. Each student will prepare an individual report based on primary data collected from field survey and secondary data collected from different sources for either a rural area ( <i>mouza</i> ) or an urban area (municipal ward) based on cadastral or municipal maps to study specific problems. .2. The duration of the field work shall not exceed 10 days. 3. The report should be hand written in English on A4 size paper in candidate's own words within 5,000 to 8,000 words excluding figures , tables , photographs , maps , references and appendices. 4. A copy of the bound report, duly signed by the concerned teacher, should be submitted.	Pranab Sahoo(PS) Subhankar Patra (SP) Chandan Karan (CK) Kishor Dandapat (KD)	2	8	8	HoD

### Reference Books

- Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Pubs. Co., New Delhi
- Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2 (2001).
- Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
- Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.

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V	Core-12 (C12T:Remote Sensing and GIS)	Unit-1.1 Principles of Remote Sensing (RS): Types of RS satellites and sensors	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.2 Sensor resolutions and their applications with reference to IRS and Landsat missions, image referencing schemes and data acquisition.	Arpita Patra (AP)		2	2	HoD
		Unit-1.3 Preparation of False Colour Composites from IRS LISS-3 and Landsat TM and OLI data.	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.4 Principles of image interpretation. Preparation of inventories of land use land cover (LULC) features from satellite images	Arpita Patra (AP)		2	2	HoD
		Unit-2.1 GIS data structures: types (spatial and non-spatial), raster and vector	Arpita Patra (AP)	1	2	2	HoD
		Unit-2.2 Principles of preparing attribute tables, data manipulation and overlay analysis	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Principles of GNSS positioning and waypoint collection	Arpita Patra (AP)	1	2	2	HoD
		Unit-2.4 Transferring of waypoints to GIS. Area and length calculations from GNSS data.	Arpita Patra (AP)		2	2	HoD
	Core-12 (C12P:Remote Sensing and GIS Lab)	Unit-1.1 Georeferencing of maps and images	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.2 Image enhancement. Preparation of reflectance libraries of LULC features across different image bands of IRS L3 or Landsat OLI data	Arpita Patra (AP)		2	2	HoD
		Unit-1.3 Image classification, post-classification analysis and class editing	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.4 Digitisation of features. Data attachment, overlay and preparation of thematic map	Arpita Patra (AP)		2	2	HoD

### Reference Books

- Campbell J. B., 2007: Introduction to Remote Sensing, Guildford Press.
- Jensen J. R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
- Joseph, G. 2005: Fundamentals of Remote Sensing, United Press India.
- Lillesand T. M., Kiefer R. W. and Chipman J. W., 2004: Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).
- Nag P. and Kudra, M., 1998: Digital Remote Sensing, Concept, New Delhi.
- Rees W. G., 2001: Physical Principles of Remote Sensing, Cambridge University Press.
- Singh R. B. and Murai S., 1998: Space-informatics for Sustainable Development, Oxford and IBH Pub.
- Sarkar, A. (2015) Practical geography:

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V	DSE-1 (DSE -1T: Hydrology and Oceanography )	Unit-1.1 Systems approach in hydrology. Global hydrological cycle: Its physical and biological role	Chandan Karan (CK)	1	2	2	HoD
		Unit-1..2Run off: controlling factors. Infiltration and evapotranspiration. Run off cycle	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.3 Drainage basin as a hydrological unit. Principles of water harvesting and watershed management	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.4 Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.1 Major relief features of the ocean floor: characteristics and origin according to plate tectonics.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2Physical and chemical properties of ocean water	Arpita Patra(AP)		2	2	HoD
		Unit-2.3Water mass, T-S diagram	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Air-Sea interactions, ocean circulation, wave and tide.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.5Ocean temperature and salinity : Distribution and determinants.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Coral reefs: Formation, classification and threats.	Asish Ghosh(AG)		2	2	HoD
		Unit-2.5 Marine resources: Classification and sustainable utilisation	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.6 . Sea level change: Types and cause	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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V	DSE-2 (DSE -2T: Social Geography )	Unit-1.1 Social Geography: Concept, Origin, Nature and Scope	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1..2 Concept of Space, Social differentiation and stratification; social processes	Arpita Patra(AP) (AG)		2	2	HoD
		Unit-1.3 Social Categories: Caste, Class, Religion, Race and Gender and their Spatial distribution	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Basis of Social region formation; Evolution of social-cultural regions of India	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.5 Peopling Process of India: Technology and Occupational Change; Migration.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.6 Social groups, social behaviour	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Concept of Social Well-being, Quality of Life, Gender and Social Well-being	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Measures of Social Well-being: Healthcare, Education, Housing, Gender Disparity	Subhankar Patra (SP)		2	2	HoD
		Unit-2.3 Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime.	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Social Planning during the Five Year Plans in India	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.5 Social Policies in India: Education and Health	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.6 Social Impact Assessment (SIA): Concept and importance	Chandan Karan (CK)		2	2	HoD

### Reference Books

- ▶ Ahmed A., 1999: Social Geography, Rawat Publications.
- ▶ Casino V. J. D., Jr., 2009) Social Geography: A Critical Introduction, Wiley Blackwell.
- ▶ Cater J. and Jones T., 2000: Social Geography: An Introduction to Contemporary Issues, Hodder Arnold.
- ▶ Holt L., 2011: Geographies of Children, Youth and Families: An International Perspective, Taylor & Francis.
- ▶ Panelli R., 2004: Social Geographies: From Difference to Action, Sage.
- ▶ Smith D. M., 1977: Human geography: A Welfare Approach, Edward Arnold, and London.
- ▶ Smith D. M., 1994: Geography and Social Justice, Blackwell, Oxford.
- ▶ Smith S. J., Pain R., Marston S. A., Jones J. P., 2009: The SAGE Handbook of Social Geographies, Sage Publications.

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2019-2020

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
V	DSE-2 (DSE -2T: Resource Geography)	Unit-1.1 Natural Resources: Concept and classification	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.2 Approaches to Resource Utilization: Utilitarian, Conservational, Community based adaptive	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Significance of Resources: Backbone of Economic growth and development	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Pressure on resources. Appraisal and Conservation on Natural Resources	Chandan Karan (CK)		2	2	HoD
		Unit-1.5 Problems of resource depletion—global scenario (forest, water, fossil fuels).	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.6 Sustainable Resource Development	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Distribution, Utilisation, Problems and Management of Metallic Mineral Resources: Iron ore, Bauxite, copper	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.2 Distribution, Utilisation, Problems and Management of Non-Metallic Mineral Resources: Limestone, Mica, Gypsum	Asish Ghosh (AG)		2	2	HoD
		Unit-2.3 Distribution, Utilisation, Problems and Management of Energy Resources: Conventional and Non-Conventional	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.4 Contemporary Energy Crisis and Future Scenario	Chandan Karan (CK)		2	2	HoD
		Unit-2.5. Politics of Power resources	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Limits to Growth and Sustainable Use of Resources; Concept of Resource sharing	Kishor Dandapat (KD)		2	2	HoD

### Reference Books

- ▶ Cutter S. N., Renwick H. L. and Renwick W., 1991: Exploitation, Conservation, And Preservation: A Geographical Perspective on Natural Resources Use, John Wiley and Sons, New York.
- ▶ Gadgil M. and Guha R., 2005: The Use and Abuse of Nature: Incorporating This Fissured Land: An Ecological History of India and Ecology and Equity, Oxford University Press. USA.
- ▶ Holechek J. L. C., Richard A., Fisher J. T. and Valdez R., 2003: Natural Resources: Ecology, Economics and Policy, Prentice Hall, New Jersey.
- ▶ Jones G. and Hollier G., 1997: Resources, Society and Environmental Management, Paul Chapman, London.
- ▶ Klee G., 1991: Conservation of Natural Resources, Prentice Hall, Englewood.
- ▶ Mather A. S. and Chapman K., 1995: Environmental Resources, John Wiley and Sons, New York.
- ▶ Mitchell B., 1997: Resource and Environmental Management, Longman Harlow, England.
- ▶ Owen S. and Owen P. L., 1991: Environment, Resources and Conservation, Cambridge University Press, New York.
- ▶ Rees J., 1990: Natural Resources: Allocation, Economics and Policy, Routledge. London

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2019-2020

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
VI	Core-13( C13T: Evolution of Geographical Thought )	Unit-1.1 Development of Geography and contributions of Greek, Chinese, and Indian geographers.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Impact of 'Dark Age' on Geography and Arab contributions	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Geography during the Age of 'Discovery' and 'Exploration' (Contributions of Portuguese Voyages, Columbus, Vasco da Gama, Magellan, Thomas Cook)	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Transition from Cosmography to Scientific Geography (Contributions of Bernard Varenius and Immanuel Kant); Dualism and Dichotomies (General vs. Particular, Physical vs. Human, Regional vs. Systematic, Determinism vs. Possibilism, Ideographic vs. Nomeothetic)	Kishor Dandapat (KD) Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Evolution of Geographical thoughts in Germany, France, Britain and United States of America.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Contributions of Humboldt and Ritter	Arpita Patra (AP)		2	2	HoD
		Unit-2.3 Contributions of Richthofen, Hettner and Ratzel	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Schools of geographical thought: French, British and American;	Asish Ghosh (AG)		2	2	HoD
		Unit-2.5 Trends of Geography in the post World War-II period	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Evolution of Geography in India: formative periods, establishments and emerging trends	Arpita Patra (AP)		2	2	HoD
Unit-2.7 Quantitative Revolution and its impact, behaviouralism, systems approach, radicalism, feminism	Kishor Dandapat (KD)	1	2	2	HoD		
Unit-2.8 Towards Post Modernism: Changing concept of space in geography. Geography in the 21st Century	Pranab Sahoo (PS)		2	2	HoD		

### Reference Books:

- ▶ Arentsen M., Stam R. and Thuijss R., 2000: Post-modern Approaches to Space, ebook.
- ▶ Bhat, L.S. (2009) Geography in India (Selected Themes). Pearson
- ▶ Bonnett A., 2008: What is Geography? Sage.
- ▶ Dikshit R. D., 1997: Geographical Thought: A Contextual History of Ideas, Prentice- Hall India.
- ▶ Hartshorn R., 1959: Perspectives of Nature of Geography, Rand MacNally and Co.
- ▶ Holt-Jensen A., 2011: Geography: History and Its Concepts: A Students Guide, SAGE.
- ▶ Johnston R. J., (Ed.): Dictionary of Human Geography, Routledge.

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Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
VI	Core-14 (C14T:Disaster Management)	Unit-1.1 Classification of hazards and disasters.	Pranab Sahoo(PS)	1	2	2	HoD
		Unit-1.2 Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms.	Kishor Dandapat(KD)		2	2	HoD
		Unit-1.3 Responses to hazards: Preparedness, trauma and aftermath. Resilience and capacity building.	Chandan Karan(CK)	1	2	2	HoD
		Unit-1.4 Hazards mapping: Data and techniques.	Subhankar Patra(SP)		2	2	HoD
		Unit-2.1 Earthquake: Factors, vulnerability, consequences and management	Subhankar Patra(SP)	1	2	2	HoD
		Unit-2.2 Landslide: Factors, vulnerability, consequences and management	Asish Ghosh(AG)		2	2	HoD
		Unit-2.3 Cyclone: Factors, vulnerability, consequences and management	Pranab Sahoo(PS)	1	2	2	HoD
		Unit-2.4 Fire: Factors, vulnerability, consequences and management	Arpita Patra (AP)		2	2	HoD
	Core-14 (C14P: Disaster Management based Project Work	An individual Project Report based on any one case study among the following disasters incorporating a preparedness plan in the vicinity of the candidate's institution or residence: 1. Thunderstorm 2. Landslide 3. Flood 4. Coastal / riverbank erosion 5. Fire 6. Industrial accident 7. Structural collapse	Pranab Sahoo(PS), Subhankar Patra(SP), Chandan Karan(CK), Kishor Dandapat(KD)	2	8	8	HoD

### Reference Books

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

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VI	DSE-3 (DSE -3T: Soil and Biogeography )	Unit-1.1 Factors of soil formation. Man as an active agent of soil transformation.	Asish Ghosh(AG)	1	2	2	HoD
		Unit-1.2 Soil profile. Origin and profile characteristics of Lateritic, Podzol and Chernozem soils	Asish Ghosh(AG)		2	2	HoD
		Unit-1.3 Definition and significance of soil properties: Texture, structure and moisture,	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Definition and significance of soil properties: p <sup>H</sup> , organic matter and NPK	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.5 Soil erosion and degradation: Factors, processes and mitigation measures	Pranab Sahoo (PS)	1	2	2	HoD
		Unit- 1.6 Principles of soil classification: Genetic and USDA. Concept of land capability and its classification	Subhankar Patra (SP)		2	2	HoD
		Unit-1.7 Concepts of biosphere, ecosystem, biome, ecotone, community and ecology	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.8 Concepts of trophic structure, food chain and food web. Energy flow in ecosystems	Chandan Karan (CK)		2	2	HoD
		Unit- 1.9 Geographical extent and characteristic features of: Tropical rain forest, Taiga and Grassland biomes	Subhankar Patra (SP)	1	2	2	HoD
		Unit- 1.10 Bio-geochemical cycles with special reference to carbon dioxide and nitrogen	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.11 Deforestation: Causes, consequences and management	Arpita Patra(AP)	1	2	2	HoD
		Unit- 1.12 Bio-diversity: Definition, types, threats and conservation measures	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2019-2020

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotting teacher	Credit (6)	Lecture, Tutorial, Practical( L-T-P)	Hours	Approved
VI	DSE-4 ( DSE -4T: Agricultural Geography )	Unit-1.1 Progress of Agricultural Geography with reference to allied disciplines. Approaches to study of Agricultural Geography.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Origin and dispersal of agriculture; Role of agriculture on human society.	Pranab Sahoo (PS)		2	2	HoD
		Unit-1. Factors affecting agriculture. Classification of world agricultural systems.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Location and characteristics of major agricultural types: Intensive subsistence, extensive commercial and plantation agriculture.	Arpita Patra(AP)		2	2	HoD
		Unit-2.1 Concept of cropping pattern, crop combination, gross and net cropped area, crop rotation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.2 A critical review and contemporary perspective of Von Thunen' model	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Definition and factors affecting yield. Measures of agricultural productivity	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Role of irrigation in Indian agriculture	Asish Ghosh (AG)		2	2	HoD
		Unit-2.5 Problems of agriculture with special reference to South Asian countries	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 World patterns of agricultural production and food security	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Land use survey and land classification (USDA)	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Globalization and agriculture with special reference to India	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

- ▶ Basu, D.N., and Guha, G.S., 1996: Agro-Climatic Regional Planning in India, Vol.I & II, Concept Publication, New Delhi.
- ▶ Bryant, C.R., Johnston, T.R, 1992: Agriculture in the City Countryside, Belhaven Press, London.
- ▶ Burger, A., 1994: Agriculture of the World, Aldershot, Avebury.
- ▶ Grigg, D.B., 1984: Introduction to Agricultural Geography, Hutchinson, London.
- ▶ Ilbery B. W., 1985: Agricultural Geography: A Social and Economic Analysis, Oxford University Press.
- ▶ Mohammad, N., 1992: New Dimension in Agriculture Geography, Vol. I to VIII, Concept Pub., New Delhi.
- ▶ Roling, N.G., and Wageruters, M.A.E.,(ed.) 1998: Facilitating Sustainable Agriculture, Cambridge University Press, Cambridge.
- ▶ Shafi, M., 2006: Agricultural Geography, Doring Kindersley India Pvt. Ltd., New Delhi
- ▶ Singh, J., and Dhillon, S.S., 1984: Agricultural Geography, Tata McGraw Hill, New Delhi.
- ▶ Tarrant J. R., 1973: Agricultural Geography, David and Charles, Devon.

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Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
I	Core-1( CIT: Geotectonics and Geomorphology)	Unit-1.1 Earth's tectonic and structural evolution with reference to geological time scale.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Earth's interior with special reference to seismology, Isostasy: Models of Airy and Pratt.	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.3 Plate Tectonics: Processes at constructive, conservative, destructive margins and hotspots; resulting landforms	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-1.4 Folds and Fault —Origin and types	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Degradational processes: Weathering, Mass wasting and resultant landforms	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Processes of entrainment, transportation and deposition by different geomorphic agents, Role of humans in landform development	Kishor Dandapat (KD)		1	1	HoD
		Unit-2.3 Development of river network and landforms on Uniclinal and folded structures	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.4 Landforms on igneous rocks with special reference to Granite and Basalt	Arpita Patra (AP)		1	1	HoD
		Unit-2.5 Karst landforms: Surface and sub-surface and landforms, Coastal processes and landforms	Subhankar Patra (SP)	1	3	3	HoD
		Unit-2.6 Glacial and fluvio-glacial processes and landforms; fluvio-glacial landforms	Chandan Karan (CK)		2	2	HoD
		Unit-2.7 Aeolian and fluvio-aeolian processes and landforms; fluvio-aeolian processes	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Models on landscape evolution: Views of Davis , Models on landscape evolution: Views of Penck, Models on landscape evolution: Views of Hack	Pranab Sahoo (PS)		2	2	HoD

### Reference Books:

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

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Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
I	Core-2(C2T, Cartographic Techniques)	Unit-1.1 Maps: Classification and types. Components of a map	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Concept and application of scales: Plain, comparative, diagonal and vernier	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Coordinate systems: Polar and rectangular. Concept of geoid and spheroid	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Concept of generating globe. Grids: angular and linear systems of measurement	Subhankar Patra (SP)		2	2	HoD
		Unit-1.5 Bearing: Magnetic and true, whole-circle and reduced.	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.6 Map projections: Classification, properties and uses. Concept and significance of UTM projection.	Pranab Sahoo (PS)		1	1	HoD
		Unit-1.7 Basic concepts of surveying and survey equipment: Prismatic compass, dumpy level, theodolite, Abney level, clinometer.	Subhankar Patra (SP) Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.8 Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps	Chandan Karan (CK)		2	2	HoD
	Core-2(C2T, Cartographic Techniques Lab)	Unit-1.1 Graphical construction of scales: Plain, comparative, diagonal and vernier	Asish Ghosh (AG)	1	2	2	HoD
		Unit-.2 Construction of projections: Polar Zenithal Stereographic, Simple conic with two standard parallels, Bonne's, Cylindrical Equal Area, and Mercator's.	Pranab Sahoo (PS) Subhankar Patra (SP)		2	2	HoD
		Unit-1.3 Delineation of drainage basin from Survey of India topographical map. Construction and interpretation of relief profiles (superimposed, projected and composite), relative relief map, slope map (Wentworth), and stream ordering (Strahler) on a drainage basin.	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Correlation between physical and cultural features from Survey of India topographical maps. using transect chart	Chandan Karan (CK)		2	2	HoD

### Reference Books

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

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Department of Geography, B.Sc. Honours/General

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II	Core-3( C3T: Human Geography )	Unit-1.1 Nature and scope and recent trends. Elements of Human Geography	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Approaches to the study of Human Geography; Resource, Locational, Landscape, Environmental	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Evolution of humans. Concept of race and ethnicity	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Space, society and cultural regions (language and religion)	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Evolution of human societies: Hunting and food gathering, pastoral nomadism, subsistence farming, industrial and urban societies	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Human adaptation to environment: Eskimo, Masai, Jarwa, Gaddi, Santhals.	Arpita Patra(AP)		1	1	HoD
		Unit-2.3 Population growth and distribution, population composition; demographic transition model	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Population–Resource regions (Ackerman)	Chandan Karan (CK)		1	1	HoD
		Unit-2.5 Human population and environment with special reference to development–environment conflict	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-2.6 Social morphology and rural house types in India	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Types and patterns of rural settlements	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Types and patterns of urban settlements	Kishor Dandapat (KD)		2	2	HoD

### Reference Books

- Bergman, E.F (1995): Human Geography-Culture, Connections and Landscape, Prentice Hall, New Jersey
- Chisholm. (1975): Human Geography, Penguin Books, Hermondsworth.
- Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.
- Johnston R; Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.
- Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York.
- Norton. W. (2001): Human Geography, 4th Edition Oxford University press, Oxford
- Pearce D. (1995): Tourism Today: A Geographical Analysis, 2nd edition, Longman Scientific & Technical, London
- Pickering K. and Owen A. A. (1997): An Introduction to Global Environmental Issues, 2nd edition Rutledge, London.
- Raw, M. (1986): Understanding Human Geography: A Practical Approach, Bell and Hyman. London
- Rubenstein, J.M. (2002), The Cultural Landscape, 7th edition, Prentice Hall, Englewood Cliffs
- Smith D M (1982): Human Geography: A Welfare Approach, Edward Arnold, London

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II	Core-4(C4T, Cartogram and Thematic Mapping)	Unit-1.1 Concepts of rounding, scientific notation, logarithm and anti-logarithm, natural and log scales	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Diagrammatic representation of data: Line, Bar, and Circle	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Representation of point data: Isoleths.	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-1.4 Representation of area data: Dots, proportional circles and Choropleth	Subhankar Patra (SP)		2	2	HoD
		Unit-1.5 Preparation and interpretation of large scale thematic maps: Geomorphological maps	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.6 Preparation and interpretation of large scale thematic maps: Climatological maps	Subhankar Patra (SP)		1	1	HoD
		Unit-1.7 Preparation and interpretation of large scale thematic maps: Landuse landcover maps	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.8 Preparation and interpretation of large scale thematic maps: Socio-economic maps	Chandan Karan (CK)		2	2	HoD
	Core-4(C4P, Cartography Lab)	Unit-1.1 Traverse survey using Prismatic Compass	Chandan Karan(CK)	1	2	2	HoD
		Unit-.2 Levelling by Dumpy Level and Prismatic Compass	Kishor Dandapat (KD) & Subhankar Patra(SP)		2	2	HoD
		Unit-1.3 Thematic maps: Proportional squares, pie diagrams with proportional circles, dots and spheres	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Thematic maps: Choropleth, isoline map, chorochromatic map	Arpita Patra(AP) & Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2020-2021

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
III	Core-5( C5T: Climatology)	Unit-1.1 Nature, composition and layering of the atmosphere	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.2 Isolation: controlling factors. Heat budget of the atmosphere	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Temperature: horizontal and vertical distribution. Inversion of temperature: types, causes and consequences	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Greenhouse effect and importance of ozone layer	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Condensation: Process and forms. Mechanism of precipitation: Bergeron-Findeisen theory, collision and coalescence. Forms of precipitation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.2 Air mass: Typology, origin, characteristics and modification.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.3 Fronts: warm and cold; frontogenesis and frontolysis.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.4 Weather: stability and instability; barotropic and baroclinic conditions.	Chandan Karan (CK)		2	2	HoD
		Unit-2.5 Circulation in the atmosphere: Planetary winds, jet stream, index cycle	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.6 Tropical and mid-latitude cyclones	Kishor Dandapat (KD)		2	2	HoD
Unit-2.7 Monsoon circulation and mechanism with reference to India	Pranab Sahoo (PS)	1	2	2	HoD		
Unit-2.8 Climatic classification after Köppen, Thornthwaite and Oliver	Pranab Sahoo (PS) & Kishor Dandapat (KD)		2	2	HoD		

### Suggested Readings:

- Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
- Barry R. G. and Corley R. J., 1998: Atmosphere, Weather and Climate, Routledge, New York.
- Critchfield H. J., 1987: General Climatology, Prentice-Hall of India, New Delhi
- Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey.
- Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
- Trewartha G. T. and Horne L. H., 1980: An Introduction to Climate, McGraw

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III	Core-6(C6T, Statistical methods in Geography)	Unit-1.1 Importance and significance of Statistics in Geography. Discrete and continuous data, population and samples, scales of measurement (nominal, ordinal, interval and ratio), sources of data.	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.2 Collection of data and formation of statistical tables	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Sampling: Need, types, and significance and methods of random sampling	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Theoretical distribution: frequency, cumulative frequency, normal and probability	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Central tendency: Mean, median, mode, partition values	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Measures of dispersion range, mean deviation, standard deviation, coefficient of variation	Kishor Dandapat (KD)		1	1	HoD
		Unit-2.3 Association and correlation: Rank correlation, product moment correlation	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Regression (linear and non-linear ) and time series analysis (moving average)	Chandan Karan (CK)		2	2	HoD
	Core-6(C6P, Statistical methods in Geography Lab)	Unit-1.1 Construction of data matrix with each row representing an aerial unit (districts / blocks / <i>mouzas</i> / towns) and corresponding columns of relevant attributes.	Kishor Dandapat (KD)	1	1	1	HoD
		Unit-1.2 Based on the above, a frequency table, measures of central tendency and dispersion would be computed and interpreted.	Pranab Sahoo(PS)		1	1	HoD
		Unit-1.3 Histograms and frequency curve would be prepared on the dataset.	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 From the data matrix a sample set (20%) would be drawn using, random, systematic and stratified methods of sampling and locate the samples on a map with a short note on methods used.	Subhankar Patra (SP)		2	2	
		Unit-1.5 Based on of the sample set and using two relevant attributes, a scatter diagram and regression line would be plotted and residual from regression would be mapped with a short interpretation.	Chandan Karan (CK)		2	2	HoD

### Suggested Readings:

- Berry B. J. L. and Marble D. F. (eds.): Spatial Analysis – A Reader in Geography.
- Ebdon D., 1977: Statistics in Geography: A Practical Approach.
- Hammond P. and McCullagh P. S., 1978: Quantitative Techniques in Geography: An Introduction.
- King L. S., 1969: Statistical Analysis in Geography, Prentice-Hall.
- Mahmood A., 1977: Statistical Methods in Geographical Studies, Concept.
- Sarkar, A. (2013) Quantitative geography: techniques and presentations. Orient Black Swan Private Ltd., New Delhi
- Spiegel M. R.: Statistics, Schaum's Outline Series.

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III	Core-7( C7T:Geography of India)	Unit-1.1 Tectonic and stratigraphic provinces, physiographic divisions	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.2 Climate, soil and vegetation: Characteristics and classification	Arpita Patra(AP)		2	2	HoD
		Unit-1.3 Population: Distribution, growth, structure and policy	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Distribution of population by race, caste, religion, language, tribes and their correlates	Asish Ghosh (AG)		2	2	HoD
		Unit-1.5 Agricultural regions. Green revolution and its consequences	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.6 Mineral and power resources distribution and utilisation of iron ore, coal, petroleum, gas;	Chandan Karan (CK)		2	2	HoD
		Unit-1.7 Industrial development: Automobile and information technology	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.8 Regionalisation of India: Physiographic (R. L. Singh), Socio-cultural (Sopher) and Economic (Sengupta)	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Physical perspectives: Physiographic divisions, forest and water resources	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Population: Growth, distribution and human development	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Resources: Mining, agriculture and industries	Chandan Karan(CK)	1	2	2	HoD
		Unit-2.4 Regional Problem: Darjeeling Hills, Jangalmahal and Sundarban	Pranab Sahoo (PS)		2	2	HoD

### Suggested Readings:

- Deshpande C. D., 1992: India: A Regional Interpretation, ICSSR, New Delhi.
- Johnson, B. L. C., ed. 2001. Geographical Dictionary of India. Vision Books, New Delhi.
- Mandal R. B. (ed.), 1990: Patterns of Regional Geography – An Intenational Perspective. Vol. 3 – Indian Perspective.
- Sdyasuk Galina and P Sengupta (1967): Economic Regionalisation of India, Census of India
- Sharma, T. C. 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi.
- Singh R. L., 1971: India: A Regional Geography, National Geographical Society of India.
- Singh, Jagdish 2003: India - A Comprehensive & Systematic Geography, Gyanodaya Prakashan, Gorakhpur.
- Spate O. H. K. and Learmonth A. T. A., 1967: India and Pakistan: A General and Regional Geography, Methuen.
- Tirtha, Ranjit 2002: Geography of India, Rawat Pubs., Jaipur & New Delhi.
- Pathak, C. R. 2003: Spatial Structure and Processes of Development in India. Regional Science Assoc., Kolkata.
- Tiwari, R.C. (2007) Geography of India. Prayag Pustak Bhawan, Allahabad
- Sharma, T.C. (2013) Economic Geography of India. Rawat Publication, Jaipur

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Department of Geography, B.Sc. Honours/General

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III	SEC-1 ( SEC-1T: Coastal Management)	Unit-1.1 Components of a coastal zone. Coastal morphodynamic variables and their role in evolution of coastal forms.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Environmental impacts and management of mining, oil exploration, salt manufacturing, land reclamation and tourism.	Chandan Karan(CK)		2	2	HoD
		Unit-1.3 Coastal hazards and their management using structural and non-structural measures: Erosion, flood, sand encroachment, dune degeneration, estuarine sedimentation and pollution	Kishor Dandapat(KD) & Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.4 Principles of Coastal Zone Management. Exclusive Economic Zone and Coastal Regulation Zones with reference to India.	Subhankar Patra(SP)		2	2	HoD

### Suggested Readings:

- Carter, R.W.G (1988): Coastal Environments: An Introduction to the Physical, Ecological and Cultural Systems of Coastlines, Academic Press, London
- Dayer K.R. (1979): Estuary Hydrography, and Sedimentation, Cambridge Univ. Press, Cambridge.
- Devis R.A. (ed) (1978): Coastal Sedimentary Environmental; Springer-Verlag, New York.
- Harikawa , K. (1978): Coastal Engineering, Univ Of Tokyo Press, Tokyo.
- Inman, D.L. (1960): Shore Processes, Encyclopedia of Science & Technology, Mc Graw Hill, New York.
- Knight, B. and Philip, A. (1979): Estuarine and coastal Land reclamation and water storage, Saxon House.
- Laussn, E and Lato, I.(ed): Chemistry and Biochemistry of estuaries, Wiley, New York.
- Pethick, J. (2000): An Introduction to coastal Geomorphology, Arnold, London.
- Stanley, D.J. and Suist D.J.P.(ed)(1976): Marine Sediment Transport and environmental management;Wiley, NewYork.
- Wagret,P. (1968): Polderlands, Methuen, London.

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IV	Core-8( C8T: Regional Planning and Development )	Unit-1.1 Concept of regions: Types of regions and their delineation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Types of planning, principles and objectives of regional planning, multi- level planning in India	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Tools and techniques of regional planning, need for regional planning in India	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Metropolitan concept: metropolitan areas, and urban agglomerations	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Development: Meaning, growth versus development	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Concept and strategies of regional development with reference to India	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.3 Theories and models for regional development : Growth pole model of perroux; growth centre model in Indian context	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Theories and models for regional development: Cumulative causation (Myrdal) and core periphery (Hirschman, Rostov and Friedman)	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.5 Changing concept of development, concept of underdevelopment; efficiency-equity debate	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.6 Indicators of development: Economic, social and environmental. Human development.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Regional development in India, regional inequality, disparity and diversity	Arpita Patra(AP)	1	2	2	HoD
Unit-2.8 Need and measures for balanced development in India	Arpita Patra (AP)	2	2		HoD		

### Reference Books

- Berry, B.J.L. and Horton, F.F. (1970): Geographic Perspectives on Urban Systems. Prentice Hall, New Jersey.
- Bhat L.S. (1972): Regional Planning In India, Statistical Publishing Society.
- Blij H. J. De, 1971: Geography: Regions and Concepts, John Wiley and Sons.
- Chand ,M and Puri V.K. ( 1983) : Regional planning In India , allied publishers , New Delhi
- Claval P.I, 1998: An Introduction to Regional Geography, Blackwell Publishers, Oxford and Massachusetts.
- Dickinson, R.E. (1964): City and Region, Rutledge, London.
- Friedmann J. and Alonso W. (1975): Regional Policy - Readings in Theory and Applications, MIT Press, Massachusetts.
- Gore C. G., 1984: Regions in Question: Space, Development Theory and Regional Policy, Methuen, London.
- Hall, P. (1992): Urban and Regional Planning, Routledge, London.
- Kulshetra ,S.K,( 2012) : Urban and Regional Planning in India : A hand book for Professional Practioners , Sage Publication , New Delhi

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2020-2021

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
IV	Core-9 (C9T:Economic Geography)	Unit-1.1 Meaning and approaches to Economic Geography, new Economic Geography.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Concepts in Economic Geography: Goods and services, production, exchange and consumption.	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Concept of economic man, theories of choices	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Economic distance and transport costs	Subhankar Patra (SP)		2	2	HoD
		Unit-2.1 Concept and classification of economic activities	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.2 Factors affecting location of economic activity with special reference to agriculture (Von Thunen), and industry (Weber).	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Primary activities: Subsistence and commercial agriculture, forestry, fishing and mining	Arpita Patra(AP)	1	2	2	HoD
		Unit-2.4 Secondary activities: Manufacturing (cotton textile, iron and steel), concept of manufacturing regions, special economic zones and technology parks	Chandan Karan(CK)		2	2	HoD
		Unit-2.5 Tertiary activities: transport, trade and services	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.6 Agricultural systems: Case studies of tea plantation in India and mixed farming in Europe	Asish Ghosh (AG)		2	2	HoD
		Unit-2.7 Transnational sea-routes, railways and highways with reference to India	Arpita Patra(AP)	1	2	2	HoD
		Unit-2.8 International agreements and trade blocs: GATT and OPEC	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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IV	Core-10 (C10T, Environmental Geography)	Unit-1.1 Geographers' approach to environmental studies	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.2 Perception of environment in different stages of civilization	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Concept of holistic environment and system approach	Arpita Patra(AP)	1	3	3	HoD
		Unit-1.4 Ecosystem: Concept, structure and functions	Chandan Karan (CK)		2	2	HoD
		Unit-2.5 Environmental pollution and degradation: Land, water and air	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.6 Space-time hierarchy of environmental problems: Local, regional and global	Chandan Karan (CK)		1	1	HoD
		Unit-1.7 Urban environmental issues with special reference to waste management	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.8 Environmental programmes and policies – Global, national and local levels	Pranab Sahoo(PS)		2	2	HoD
	Core-10 (C10P, Environmental Geography Lab)	Unit-1.1 Preparation of questionnaire for perception survey on environmental problems.	Kishor Dandapat (KD)	1	1	1	HoD
		Unit-1.2 Preparation of check-list for Environmental Impact Assessment of an urban / industrial project	Subhankar Patra (SP)		1	1	HoD
		Unit-1.3 Quality assessment of soil using field kit: pH and NPK	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Interpretation of air quality using CPCB / WBPCB data	Pranab Sahoo(PS)		2	2	HoD

### Reference Books

- Chandna R. C., 2002: Environmental Geography, Kalyani, Ludhiana.
- Cunningham W. P. and Cunningham M. A., 2004: Principals of Environmental Science: Inquiry and Applications, Tata Macgraw Hill, New Delhi.
- Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
- Singh, R.B. (Eds.) (2009) Biogeography and Biodiversity. Rawat Publication, Jaipur
- Miller G. T., 2004: Environmental Science: Working with the Earth, Thomson BrooksCole, Singapore.
- MoEF, 2006: National Environmental Policy-2006, Ministry of Environment and Forests, Government of India.
- Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India.
- Odum, E. P. et al, 2005: Fundamentals of Ecology, Ceneage Learning India.
- Singh S., 1997: Environmental Geography, Prayag Pustak Bhawan. Allahabad.
- UNEP, 2007: Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme.
- Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1.
- Singh, R.B. (1998) Ecological Techniques and Approaches to Vulnerable Environment, New Delhi, Oxford & IBH Pub.

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IV	SEC-2 (SEC-2T: Research Method)	Unit-1.1 Geographic Enquiry: Definition and Ethics; Literature Review; Framing Research Questions, Objectives and Hypothesis; Preparing Sample Questionnaires and inventories	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Data Collection: Type and Sources of Data; Methods of data Collection; Data Input and Editing	Chandan Karan(CK)		2	2	HoD
		Unit-1.3 Data Analysis: Qualitative and Quantitative Analysis; Techniques Data Representation	Kishor Dandapat(KD)	1	2	2	HoD
		Unit-1.4 Structure of a Research Report: Preliminaries; Text; Citation, Notes, References, Bibliography and Abstract and Key words.	Subhankar Patra(SP)		2	2	HoD

### Reference Books

- ▶ Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- ▶ Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- ▶ Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- ▶ Misra, R.P. (2002) Research Methodology, Concept Publications, New Delhi.
- ▶ Mukherjee, Neela 1993. Participatory Rural Appraisal: Methodology and Application. Concept Pubs. Co., New Delhi.
- ▶ Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Pubs. Co., New Delhi
- ▶ Robinson A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.
- ▶ Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2 (2001).
- ▶ Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
- ▶ Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.
- ▶ Yadav, H. (2013) Shodh Pravidhi Evam Matratamak Bhugol, Raja Publications, Delhi

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V	Core-11( C11T: Field Work and Research Methodology)	Unit-1.1 Research in Geography: Meaning, types and significance, abstract and keywords	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Literature review and formulation of research design	Subhankar Patra (SP)		2	2	HoD
		Unit-1.3 Defining research problem, objectives and hypothesis. Research materials and methods	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Techniques of writing scientific reports: Preparing notes, references, bibliography	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Fieldwork in Geographical studies – Role and significance. Selection of study area and objectives. Pre-field preparations. Ethics of fieldwork	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Field techniques and tools: Observation (participant, non participant), questionnaires (open, closed, structured, non-structured). Interview with special reverence to focused group discussions.	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Positioning and collection of samples. Preparation of inventory from field data. Post-field tasks.	Subhankar Patra (SP)		2	2	HoD
	Core-11 ( C11P: Research Methodology and Field Work Lab)	1. Each student will prepare an individual report based on primary data collected from field survey and secondary data collected from different sources for either a rural area ( <i>mouza</i> ) or an urban area (municipal ward) based on cadastral or municipal maps to study specific problems. .2. The duration of the field work shall not exceed 10 days. 3. The report should be hand written in English on A4 size paper in candidate's own words within 5,000 to 8,000 words excluding figures , tables , photographs , maps , references and appendices. 4. A copy of the bound report, duly signed by the concerned teacher, should be submitted.	Pranab Sahoo(PS) Subhankar Patra (SP) Chandan Karan (CK) Kishor Dandapat (KD)	2	8	8	HoD

### Reference Books

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- Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
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- Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.

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CBCS (Choice Based Credit System), Session: 2020-2021

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
V	Core-12 (C12T:Remote Sensing and GIS)	Unit-1.1 Principles of Remote Sensing (RS): Types of RS satellites and sensors	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.2 Sensor resolutions and their applications with reference to IRS and Landsat missions, image referencing schemes and data acquisition.	Arpita Patra (AP)		2	2	HoD
		Unit-1.3 Preparation of False Colour Composites from IRS LISS-3 and Landsat TM and OLI data.	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.4 Principles of image interpretation. Preparation of inventories of land use land cover (LULC) features from satellite images	Arpita Patra (AP)		2	2	HoD
		Unit-2.1 GIS data structures: types (spatial and non-spatial), raster and vector	Arpita Patra (AP)	1	2	2	HoD
		Unit-2.2 Principles of preparing attribute tables, data manipulation and overlay analysis	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Principles of GNSS positioning and waypoint collection	Arpita Patra (AP)	1	2	2	HoD
		Unit-2.4 Transferring of waypoints to GIS. Area and length calculations from GNSS data.	Arpita Patra (AP)		2	2	HoD
	Core-12 (C12P:Remote Sensing and GIS Lab)	Unit-1.1 Georeferencing of maps and images	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.2 Image enhancement. Preparation of reflectance libraries of LULC features across different image bands of IRS L3 or Landsat OLI data	Arpita Patra (AP)		2	2	HoD
		Unit-1.3 Image classification, post-classification analysis and class editing	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.4 Digitisation of features. Data attachment, overlay and preparation of thematic map	Arpita Patra (AP)		2	2	HoD

### Reference Books

- Campbell J. B., 2007: Introduction to Remote Sensing, Guildford Press.
- Jensen J. R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
- Joseph, G. 2005: Fundamentals of Remote Sensing, United Press India.
- Lillesand T. M., Kiefer R. W. and Chipman J. W., 2004: Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).
- Nag P. and Kudra, M., 1998: Digital Remote Sensing, Concept, New Delhi.
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- Sarkar, A. (2015) Practical geography:

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V	DSE-1 (DSE -1T: Hydrology and Oceanography )	Unit-1.1 Systems approach in hydrology. Global hydrological cycle: Its physical and biological role	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Run off: controlling factors. Infiltration and evapotranspiration. Run off cycle	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.3 Drainage basin as a hydrological unit. Principles of water harvesting and watershed management	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.4 Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.1 Major relief features of the ocean floor: characteristics and origin according to plate tectonics.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Physical and chemical properties of ocean water	Arpita Patra(AP)		2	2	HoD
		Unit-2.3 Water mass, T-S diagram	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Air-Sea interactions, ocean circulation, wave and tide.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.5 Ocean temperature and salinity : Distribution and determinants.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Coral reefs: Formation, classification and threats.	Asish Ghosh(AG)		2	2	HoD
		Unit-2.5 Marine resources: Classification and sustainable utilisation	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.6 . Sea level change: Types and cause	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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CBCS (Choice Based Credit System), Session: 2020-2021

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
V	DSE-2 (DSE -2T: Social Geography )	Unit-1.1 Social Geography: Concept, Origin, Nature and Scope	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1..2 Concept of Space, Social differentiation and stratification; social processes	Arpita Patra(AP) (AG)		2	2	HoD
		Unit-1.3 Social Categories: Caste, Class, Religion, Race and Gender and their Spatial distribution	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Basis of Social region formation; Evolution of social-cultural regions of India	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.5 Peopling Process of India: Technology and Occupational Change; Migration.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.6 Social groups, social behaviour	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Concept of Social Well-being, Quality of Life, Gender and Social Well-being	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Measures of Social Well-being: Healthcare, Education, Housing, Gender Disparity	Subhankar Patra (SP)		2	2	HoD
		Unit-2.3 Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime.	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Social Planning during the Five Year Plans in India	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.5 Social Policies in India: Education and Health	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.6 Social Impact Assessment (SIA): Concept and importance	Chandan Karan (CK)		2	2	HoD

### Reference Books

- ▶ Ahmed A., 1999: Social Geography, Rawat Publications.
- ▶ Casino V. J. D., Jr., 2009) Social Geography: A Critical Introduction, Wiley Blackwell.
- ▶ Cater J. and Jones T., 2000: Social Geography: An Introduction to Contemporary Issues, Hodder Arnold.
- ▶ Holt L., 2011: Geographies of Children, Youth and Families: An International Perspective, Taylor & Francis.
- ▶ Panelli R., 2004: Social Geographies: From Difference to Action, Sage.
- ▶ Smith D. M., 1977: Human geography: A Welfare Approach, Edward Arnold, and London.
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- ▶ Smith S. J., Pain R., Marston S. A., Jones J. P., 2009: The SAGE Handbook of Social Geographies, Sage Publications.

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V	DSE-2 (DSE -2T: Resource Geography)	Unit-1.1 Natural Resources: Concept and classification	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.2 Approaches to Resource Utilization: Utilitarian, Conservational, Community based adaptive	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Significance of Resources: Backbone of Economic growth and development	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Pressure on resources. Appraisal and Conservation on Natural Resources	Chandan Karan (CK)		2	2	HoD
		Unit-1.5 Problems of resource depletion—global scenario (forest, water, fossil fuels).	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.6 Sustainable Resource Development	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Distribution, Utilisation, Problems and Management of Metallic Mineral Resources: Iron ore, Bauxite, copper	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.2 Distribution, Utilisation, Problems and Management of Non-Metallic Mineral Resources: Limestone, Mica, Gypsum	Asish Ghosh (AG)		2	2	HoD
		Unit-2.3 Distribution, Utilisation, Problems and Management of Energy Resources: Conventional and Non-Conventional	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.4 Contemporary Energy Crisis and Future Scenario	Chandan Karan (CK)		2	2	HoD
		Unit-2.5. Politics of Power resources	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Limits to Growth and Sustainable Use of Resources; Concept of Resource sharing	Kishor Dandapat (KD)		2	2	HoD

### Reference Books

- ▶ Cutter S. N., Renwick H. L. and Renwick W., 1991: Exploitation, Conservation, And Preservation: A Geographical Perspective on Natural Resources Use, John Wiley and Sons, New York.
- ▶ Gadgil M. and Guha R., 2005: The Use and Abuse of Nature: Incorporating This Fissured Land: An Ecological History of India and Ecology and Equity, Oxford University Press. USA.
- ▶ Holechek J. L. C., Richard A., Fisher J. T. and Valdez R., 2003: Natural Resources: Ecology, Economics and Policy, Prentice Hall, New Jersey.
- ▶ Jones G. and Hollier G., 1997: Resources, Society and Environmental Management, Paul Chapman, London.
- ▶ Klee G., 1991: Conservation of Natural Resources, Prentice Hall, Englewood.
- ▶ Mather A. S. and Chapman K., 1995: Environmental Resources, John Wiley and Sons, New York.
- ▶ Mitchell B., 1997: Resource and Environmental Management, Longman Harlow, England.
- ▶ Owen S. and Owen P. L., 1991: Environment, Resources and Conservation, Cambridge University Press, New York.
- ▶ Rees J., 1990: Natural Resources: Allocation, Economics and Policy, Routledge. London

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CBCS (Choice Based Credit System), Session: 2020-2021

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
VI	Core-13( C13T: Evolution of Geographical Thought )	Unit-1.1 Development of Geography and contributions of Greek, Chinese, and Indian geographers.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Impact of 'Dark Age' on Geography and Arab contributions	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Geography during the Age of 'Discovery' and 'Exploration' (Contributions of Portuguese Voyages, Columbus, Vasco da Gama, Magellan, Thomas Cook)	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Transition from Cosmography to Scientific Geography (Contributions of Bernard Varenius and Immanuel Kant); Dualism and Dichotomies (General vs. Particular, Physical vs. Human, Regional vs. Systematic, Determinism vs. Possibilism, Ideographic vs. Nomeothetic)	Kishor Dandapat (KD) Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Evolution of Geographical thoughts in Germany, France, Britain and United States of America.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Contributions of Humboldt and Ritter	Arpita Patra (AP)		2	2	HoD
		Unit-2.3 Contributions of Richthofen, Hettner and Ratzel	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Schools of geographical thought: French, British and American;	Asish Ghosh (AG)		2	2	HoD
		Unit-2.5 Trends of Geography in the post World War-II period	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Evolution of Geography in India: formative periods, establishments and emerging trends	Arpita Patra (AP)		2	2	HoD
Unit-2.7 Quantitative Revolution and its impact, behaviouralism, systems approach, radicalism, feminism	Kishor Dandapat (KD)	1	2	2	HoD		
Unit-2.8 Towards Post Modernism: Changing concept of space in geography. Geography in the 21st Century	Pranab Sahoo (PS)		2	2	HoD		

### Reference Books:

- ▶ Arentsen M., Stam R. and Thuijss R., 2000: Post-modern Approaches to Space, ebook.
- ▶ Bhat, L.S. (2009) Geography in India (Selected Themes). Pearson
- ▶ Bonnett A., 2008: What is Geography? Sage.
- ▶ Dikshit R. D., 1997: Geographical Thought: A Contextual History of Ideas, Prentice- Hall India.
- ▶ Hartshorn R., 1959: Perspectives of Nature of Geography, Rand MacNally and Co.
- ▶ Holt-Jensen A., 2011: Geography: History and Its Concepts: A Students Guide, SAGE.
- ▶ Johnston R. J., (Ed.): Dictionary of Human Geography, Routledge.

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VI	Core-14 (C14T: Disaster Management)	Unit-1.1 Classification of hazards and disasters.	Pranab Sahoo(PS)	1	2	2	HoD
		Unit-1.2 Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms.	Kishor Dandapat(KD)		2	2	HoD
		Unit-1.3 Responses to hazards: Preparedness, trauma and aftermath. Resilience and capacity building.	Chandan Karan(CK)	1	2	2	HoD
		Unit-1.4 Hazards mapping: Data and techniques.	Subhankar Patra(SP)		2	2	HoD
		Unit-2.1 Earthquake: Factors, vulnerability, consequences and management	Subhankar Patra(SP)	1	2	2	HoD
		Unit-2.2 Landslide: Factors, vulnerability, consequences and management	Asish Ghosh(AG)		2	2	HoD
		Unit-2.3 Cyclone: Factors, vulnerability, consequences and management	Pranab Sahoo(PS)	1	2	2	HoD
		Unit-2.4 Fire: Factors, vulnerability, consequences and management	Arpita Patra (AP)		2	2	HoD
	Core-14 (C14P: Disaster Management based Project Work)	An individual Project Report based on any one case study among the following disasters incorporating a preparedness plan in the vicinity of the candidate's institution or residence: 1. Thunderstorm 2. Landslide 3. Flood 4. Coastal / riverbank erosion 5. Fire 6. Industrial accident 7. Structural collapse	Pranab Sahoo(PS), Subhankar Patra(SP), Chandan Karan(CK), Kishor Dandapat(KD)	2	8	8	HoD

### Reference Books

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

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VI	DSE-3 (DSE -3T: Soil and Biogeography )	Unit-1.1 Factors of soil formation. Man as an active agent of soil transformation.	Asish Ghosh(AG)	1	2	2	HoD
		Unit-1.2 Soil profile. Origin and profile characteristics of Lateritic, Podzol and Chernozem soils	Asish Ghosh(AG)		2	2	HoD
		Unit-1.3 Definition and significance of soil properties: Texture, structure and moisture,	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Definition and significance of soil properties: p <sup>H</sup> , organic matter and NPK	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.5 Soil erosion and degradation: Factors, processes and mitigation measures	Pranab Sahoo (PS)	1	2	2	HoD
		Unit- 1.6 Principles of soil classification: Genetic and USDA. Concept of land capability and its classification	Subhankar Patra (SP)		2	2	HoD
		Unit-1.7 Concepts of biosphere, ecosystem, biome, ecotone, community and ecology	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.8 Concepts of trophic structure, food chain and food web. Energy flow in ecosystems	Chandan Karan (CK)		2	2	HoD
		Unit- 1.9 Geographical extent and characteristic features of: Tropical rain forest, Taiga and Grassland biomes	Subhankar Patra (SP)	1	2	2	HoD
		Unit- 1.10 Bio-geochemical cycles with special reference to carbon dioxide and nitrogen	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.11 Deforestation: Causes, consequences and management	Arpita Patra(AP)	1	2	2	HoD
		Unit- 1.12 Bio-diversity: Definition, types, threats and conservation measures	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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VI	DSE-4 ( DSE -4T: Agricultural Geography )	Unit-1.1 Progress of Agricultural Geography with reference to allied disciplines. Approaches to study of Agricultural Geography.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Origin and dispersal of agriculture; Role of agriculture on human society.	Pranab Sahoo (PS)		2	2	HoD
		Unit-1. Factors affecting agriculture. Classification of world agricultural systems.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Location and characteristics of major agricultural types: Intensive subsistence, extensive commercial and plantation agriculture.	Arpita Patra(AP)		2	2	HoD
		Unit-2.1 Concept of cropping pattern, crop combination, gross and net cropped area, crop rotation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.2 A critical review and contemporary perspective of Von Thunen' model	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Definition and factors affecting yield. Measures of agricultural productivity	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Role of irrigation in Indian agriculture	Asish Ghosh (AG)		2	2	HoD
		Unit-2.5 Problems of agriculture with special reference to South Asian countries	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 World patterns of agricultural production and food security	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Land use survey and land classification (USDA)	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Globalization and agriculture with special reference to India	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

- ▶ Basu, D.N., and Guha, G.S., 1996: Agro-Climatic Regional Planning in India, Vol.I & II, Concept Publication, New Delhi.
- ▶ Bryant, C.R., Johnston, T.R, 1992: Agriculture in the City Countryside, Belhaven Press, London.
- ▶ Burger, A., 1994: Agriculture of the World, Aldershot, Avebury.
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- ▶ Ilbery B. W., 1985: Agricultural Geography: A Social and Economic Analysis, Oxford University Press.
- ▶ Mohammad, N., 1992: New Dimension in Agriculture Geography, Vol. I to VIII, Concept Pub., New Delhi.
- ▶ Roling, N.G., and Wageruters, M.A.E.,(ed.) 1998: Facilitating Sustainable Agriculture, Cambridge University Press, Cambridge.
- ▶ Shafi, M., 2006: Agricultural Geography, Doring Kindersley India Pvt. Ltd., New Delhi
- ▶ Singh, J., and Dhillon, S.S., 1984: Agricultural Geography, Tata McGraw Hill, New Delhi.
- ▶ Tarrant J. R., 1973: Agricultural Geography, David and Charles, Devon.

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I	Core-1( CIT: Geotectonics and Geomorphology)	Unit-1.1 Earth's tectonic and structural evolution with reference to geological time scale.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Earth's interior with special reference to seismology, Isostasy: Models of Airy and Pratt.	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.3 Plate Tectonics: Processes at constructive, conservative, destructive margins and hotspots; resulting landforms	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-1.4 Folds and Fault —Origin and types	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Degradational processes: Weathering, Mass wasting and resultant landforms	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Processes of entrainment, transportation and deposition by different geomorphic agents, Role of humans in landform development	Kishor Dandapat (KD)		1	1	HoD
		Unit-2.3 Development of river network and landforms on Uniclinal and folded structures	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.4 Landforms on igneous rocks with special reference to Granite and Basalt	Arpita Patra (AP)		1	1	HoD
		Unit-2.5 Karst landforms: Surface and sub-surface and landforms, Coastal processes and landforms	Subhankar Patra (SP)	1	3	3	HoD
		Unit-2.6 Glacial and fluvio-glacial processes and landforms; fluvio-glacial landforms	Chandan Karan (CK)		2	2	HoD
		Unit-2.7 Aeolian and fluvio-aeolian processes and landforms; fluvio-aeolian processes	Asish Ghosh (AG)	1	2	2	HoD
Unit-2.8 Models on landscape evolution: Views of Davis , Models on landscape evolution: Views of Penck, Models on landscape evolution: Views of Hack	Pranab Sahoo (PS)	2	2		HoD		

### Reference Books:

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

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# SEVA BHARATI MAHA VIDYALAYA

## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General  
CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
I	Core-2(C2T, Cartographic Techniques)	Unit-1.1 Maps: Classification and types. Components of a map	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Concept and application of scales: Plain, comparative, diagonal and vernier	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Coordinate systems: Polar and rectangular. Concept of geoid and spheroid	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Concept of generating globe. Grids: angular and linear systems of measurement	Subhankar Patra (SP)		2	2	HoD
		Unit-1.5 Bearing: Magnetic and true, whole-circle and reduced.	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.6 Map projections: Classification, properties and uses. Concept and significance of UTM projection.	Pranab Sahoo (PS)		1	1	HoD
		Unit-1.7 Basic concepts of surveying and survey equipment: Prismatic compass, dumpy level, theodolite, Abney level, clinometer.	Subhankar Patra (SP) Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.8 Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps	Chandan Karan (CK)		2	2	HoD
	Core-2(C2T, Cartographic Techniques Lab)	Unit-1.1 Graphical construction of scales: Plain, comparative, diagonal and vernier	Asish Ghosh (AG)	1	2	2	HoD
		Unit-.2 Construction of projections: Polar Zenithal Stereographic, Simple conic with two standard parallels, Bonne's, Cylindrical Equal Area, and Mercator's.	Pranab Sahoo (PS) Subhankar Patra (SP)		2	2	HoD
		Unit-1.3 Delineation of drainage basin from Survey of India topographical map. Construction and interpretation of relief profiles (superimposed, projected and composite), relative relief map, slope map (Wentworth), and stream ordering (Strahler) on a drainage basin.	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Correlation between physical and cultural features from Survey of India topographical maps. using transect chart	Chandan Karan (CK)		2	2	HoD

### Reference Books

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

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
II	Core-3( C3T: Human Geography )	Unit-1.1 Nature and scope and recent trends. Elements of Human Geography	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Approaches to the study of Human Geography; Resource, Locational, Landscape, Environmental	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Evolution of humans. Concept of race and ethnicity	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Space, society and cultural regions (language and religion)	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Evolution of human societies: Hunting and food gathering, pastoral nomadism, subsistence farming, industrial and urban societies	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Human adaptation to environment: Eskimo, Masai, Jarwa, Gaddi, Santhals.	Arpita Patra(AP)		1	1	HoD
		Unit-2.3 Population growth and distribution, population composition; demographic transition model	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Population–Resource regions (Ackerman)	Chandan Karan (CK)		1	1	HoD
		Unit-2.5 Human population and environment with special reference to development–environment conflict	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-2.6 Social morphology and rural house types in India	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Types and patterns of rural settlements	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Types and patterns of urban settlements	Kishor Dandapat (KD)		2	2	HoD

### Reference Books

- Bergman, E.F (1995): Human Geography-Culture, Connections and Landscape, Prentice Hall, New Jersey
- Chisholm. (1975): Human Geography, Penguin Books, Hermondsworth.
- Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.
- Johnston R; Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.
- Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York.
- Norton. W. (2001): Human Geography, 4th Edition Oxford University press, Oxford
- Pearce D. (1995): Tourism Today: A Geographical Analysis, 2nd edition, Longman Scientific & Technical, London
- Pickering K. and Owen A. A. (1997): An Introduction to Global Environmental Issues, 2nd edition Rutledge, London.
- Raw, M. (1986): Understanding Human Geography: A Practical Approach, Bell and Hyman. London
- Rubenstein, J.M. (2002), The Cultural Landscape, 7th edition, Prentice Hall, Englewood Cliffs
- Smith D M (1982): Human Geography: A Welfare Approach, Edward Arnold, London

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
II	Core-4(C4T, Cartogram and Thematic Mapping)	Unit-1.1 Concepts of rounding, scientific notation, logarithm and anti-logarithm, natural and log scales	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Diagrammatic representation of data: Line, Bar, and Circle	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Representation of point data: Isoleths.	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-1.4 Representation of area data: Dots, proportional circles and Choropleth	Subhankar Patra (SP)		2	2	HoD
		Unit-1.5 Preparation and interpretation of large scale thematic maps: Geomorphological maps	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.6 Preparation and interpretation of large scale thematic maps: Climatological maps	Subhankar Patra (SP)		1	1	HoD
		Unit-1.7 Preparation and interpretation of large scale thematic maps: Landuse landcover maps	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.8 Preparation and interpretation of large scale thematic maps: Socio-economic maps	Chandan Karan (CK)		2	2	HoD
	Core-4(C4P, Cartography Lab)	Unit-1.1 Traverse survey using Prismatic Compass	Chandan Karan(CK)	1	2	2	HoD
		Unit-.2 Levelling by Dumpy Level and Prismatic Compass	Kishor Dandapat (KD) & Subhankar Patra(SP)		2	2	HoD
		Unit-1.3 Thematic maps: Proportional squares, pie diagrams with proportional circles, dots and spheres	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Thematic maps: Choropleth, isoline map, chorochromatic map	Arpita Patra(AP) & Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
III	Core-5( C5T: Climatology)	Unit-1.1 Nature, composition and layering of the atmosphere	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.2 Isolation: controlling factors. Heat budget of the atmosphere	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Temperature: horizontal and vertical distribution. Inversion of temperature: types, causes and consequences	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Greenhouse effect and importance of ozone layer	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Condensation: Process and forms. Mechanism of precipitation: Bergeron-Findeisen theory, collision and coalescence. Forms of precipitation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.2 Air mass: Typology, origin, characteristics and modification.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.3 Fronts: warm and cold; frontogenesis and frontolysis.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.4 Weather: stability and instability; barotropic and baroclinic conditions.	Chandan Karan (CK)		2	2	HoD
		Unit-2.5 Circulation in the atmosphere: Planetary winds, jet stream, index cycle	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.6 Tropical and mid-latitude cyclones	Kishor Dandapat (KD)		2	2	HoD
Unit-2.7 Monsoon circulation and mechanism with reference to India	Pranab Sahoo (PS)	1	2	2	HoD		
Unit-2.8 Climatic classification after Köppen, Thornthwaite and Oliver	Pranab Sahoo (PS) & Kishor Dandapat (KD)		2	2	HoD		

### Suggested Readings:

- Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
- Barry R. G. and Corley R. J., 1998: Atmosphere, Weather and Climate, Routledge, New York.
- Critchfield H. J., 1987: General Climatology, Prentice-Hall of India, New Delhi
- Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey.
- Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
- Trewartha G. T. and Horne L. H., 1980: An Introduction to Climate, McGraw

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## Syllabus Distribution and Unit Wise Lesson Plan

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Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical ( L-T-P)	Hours	Approved
III	Core-6(C6T, Statistical methods in Geography)	Unit-1.1 Importance and significance of Statistics in Geography. Discrete and continuous data, population and samples, scales of measurement (nominal, ordinal, interval and ratio), sources of data.	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.2 Collection of data and formation of statistical tables	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Sampling: Need, types, and significance and methods of random sampling	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Theoretical distribution: frequency, cumulative frequency, normal and probability	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Central tendency: Mean, median, mode, partition values	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Measures of dispersion range, mean deviation, standard deviation, coefficient of variation	Kishor Dandapat (KD)		1	1	HoD
		Unit-2.3 Association and correlation: Rank correlation, product moment correlation	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Regression (linear and non-linear ) and time series analysis (moving average)	Chandan Karan (CK)		2	2	HoD
	Core-6(C6P, Statistical methods in Geography Lab)	Unit-1.1 Construction of data matrix with each row representing an aerial unit (districts / blocks / <i>mouzas</i> / towns) and corresponding columns of relevant attributes.	Kishor Dandapat (KD)	1	1	1	HoD
		Unit-1.2 Based on the above, a frequency table, measures of central tendency and dispersion would be computed and interpreted.	Pranab Sahoo(PS)		1	1	HoD
		Unit-1.3 Histograms and frequency curve would be prepared on the dataset.	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 From the data matrix a sample set (20%) would be drawn using, random, systematic and stratified methods of sampling and locate the samples on a map with a short note on methods used.	Subhankar Patra (SP)		2	2	
		Unit-1.5 Based on of the sample set and using two relevant attributes, a scatter diagram and regression line would be plotted and residual from regression would be mapped with a short interpretation.	Chandan Karan (CK)		2	2	HoD

### Suggested Readings:

- Berry B. J. L. and Marble D. F. (eds.): Spatial Analysis – A Reader in Geography.
- Ebdon D., 1977: Statistics in Geography: A Practical Approach.
- Hammond P. and McCullagh P. S., 1978: Quantitative Techniques in Geography: An Introduction.
- King L. S., 1969: Statistical Analysis in Geography, Prentice-Hall.
- Mahmood A., 1977: Statistical Methods in Geographical Studies, Concept.
- Sarkar, A. (2013) Quantitative geography: techniques and presentations. Orient Black Swan Private Ltd., New Delhi
- Spiegel M. R.: Statistics, Schaum's Outline Series.

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
III	Core-7( C7T:Geography of India)	Unit-1.1 Tectonic and stratigraphic provinces, physiographic divisions	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.2 Climate, soil and vegetation: Characteristics and classification	Arpita Patra(AP)		2	2	HoD
		Unit-1.3 Population: Distribution, growth, structure and policy	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Distribution of population by race, caste, religion, language, tribes and their correlates	Asish Ghosh (AG)		2	2	HoD
		Unit-1.5 Agricultural regions. Green revolution and its consequences	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.6 Mineral and power resources distribution and utilisation of iron ore, coal, petroleum, gas;	Chandan Karan (CK)		2	2	HoD
		Unit-1.7 Industrial development: Automobile and information technology	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.8 Regionalisation of India: Physiographic (R. L. Singh), Socio-cultural (Sopher) and Economic (Sengupta)	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Physical perspectives: Physiographic divisions, forest and water resources	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Population: Growth, distribution and human development	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Resources: Mining, agriculture and industries	Chandan Karan(CK)	1	2	2	HoD
		Unit-2.4 Regional Problem: Darjeeling Hills, Jangalmahal and Sundarban	Pranab Sahoo (PS)		2	2	HoD

### Suggested Readings:

- Deshpande C. D., 1992: India: A Regional Interpretation, ICSSR, New Delhi.
- Johnson, B. L. C., ed. 2001. Geographical Dictionary of India. Vision Books, New Delhi.
- Mandal R. B. (ed.), 1990: Patterns of Regional Geography – An Intenational Perspective. Vol. 3 – Indian Perspective.
- Sdyasuk Galina and P Sengupta (1967): Economic Regionalisation of India, Census of India
- Sharma, T. C. 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi.
- Singh R. L., 1971: India: A Regional Geography, National Geographical Society of India.
- Singh, Jagdish 2003: India - A Comprehensive & Systematic Geography, Gyanodaya Prakashan, Gorakhpur.
- Spate O. H. K. and Learmonth A. T. A., 1967: India and Pakistan: A General and Regional Geography, Methuen.
- Tirtha, Ranjit 2002: Geography of India, Rawat Pubs., Jaipur & New Delhi.
- Pathak, C. R. 2003: Spatial Structure and Processes of Development in India. Regional Science Assoc., Kolkata.
- Tiwari, R.C. (2007) Geography of India. Prayag Pustak Bhawan, Allahabad
- Sharma, T.C. (2013) Economic Geography of India. Rawat Publication, Jaipur

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical(L-T-P)	Hours	Approved
III	SEC-1 ( SEC-1T: Coastal Management)	Unit-1.1 Components of a coastal zone. Coastal morphodynamic variables and their role in evolution of coastal forms.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Environmental impacts and management of mining, oil exploration, salt manufacturing, land reclamation and tourism.	Chandan Karan(CK)		2	2	HoD
		Unit-1.3 Coastal hazards and their management using structural and non-structural measures: Erosion, flood, sand encroachment, dune degeneration, estuarine sedimentation and pollution	Kishor Dandapat(KD) & Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.4 Principles of Coastal Zone Management. Exclusive Economic Zone and Coastal Regulation Zones with reference to India.	Subhankar Patra(SP)		2	2	HoD

### Suggested Readings:

- Carter, R.W.G (1988): Coastal Environments: An Introduction to the Physical, Ecological and Cultural Systems of Coastlines, Academic Press, London
- Dayer K.R. (1979): Estuary Hydrography, and Sedimentation, Cambridge Univ. Press, Cambridge.
- Devis R.A. (ed) (1978): Coastal Sedimentary Environmental; Springer-Verlag, New York.
- Harikawa , K. (1978): Coastal Engineering, Univ Of Tokyo Press, Tokyo.
- Inman, D.L. (1960): Shore Processes, Encyclopedia of Science & Technology, Mc Graw Hill, New York.
- Knight, B. and Philip, A. (1979): Estuarine and coastal Land reclamation and water storage, Saxon House.
- Laussn, E and Lato, I.(ed): Chemistry and Biochemistry of estuaries, Wiley, New York.
- Pethick, J. (2000): An Introduction to coastal Geomorphology, Arnold, London.
- Stanley, D.J. and Suist D.J.P.(ed)(1976): Marine Sediment Transport and environmental management;Wiley, NewYork.
- Wagret,P. (1968): Polderlands, Methuen, London.

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CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
IV	Core-8( C8T: Regional Planning and Development )	Unit-1.1 Concept of regions: Types of regions and their delineation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Types of planning, principles and objectives of regional planning, multi- level planning in India	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Tools and techniques of regional planning, need for regional planning in India	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Metropolitan concept: metropolitan areas, and urban agglomerations	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Development: Meaning, growth versus development	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Concept and strategies of regional development with reference to India	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.3 Theories and models for regional development : Growth pole model of perroux; growth centre model in Indian context	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Theories and models for regional development: Cumulative causation (Myrdal) and core periphery (Hirschman, Rostov and Friedman)	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.5 Changing concept of development, concept of underdevelopment; efficiency-equity debate	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.6 Indicators of development: Economic, social and environmental. Human development.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Regional development in India, regional inequality, disparity and diversity	Arpita Patra(AP)	1	2	2	HoD
Unit-2.8 Need and measures for balanced development in India	Arpita Patra (AP)	2	2		HoD		

### Reference Books

- Berry, B.J.L. and Horton, F.F. (1970): Geographic Perspectives on Urban Systems. Prentice Hall, New Jersey.
- Bhat L.S. (1972): Regional Planning In India, Statistical Publishing Society.
- Blij H. J. De, 1971: Geography: Regions and Concepts, John Wiley and Sons.
- Chand ,M and Puri V.K. ( 1983) : Regional planning In India , allied publishers , New Delhi
- Claval P.I, 1998: An Introduction to Regional Geography, Blackwell Publishers, Oxford and Massachusetts.
- Dickinson, R.E. (1964): City and Region, Rutledge, London.
- Friedmann J. and Alonso W. (1975): Regional Policy - Readings in Theory and Applications, MIT Press, Massachusetts.
- Gore C. G., 1984: Regions in Question: Space, Development Theory and Regional Policy, Methuen, London.
- Hall, P. (1992): Urban and Regional Planning, Routledge, London.
- Kulshetra ,S.K,( 2012) : Urban and Regional Planning in India : A hand book for Professional Practioners , Sage Publication , New Delhi

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CBCS (Choice Based Credit System), Session: 2021-2022

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IV	Core-9 (C9T:Economic Geography)	Unit-1.1 Meaning and approaches to Economic Geography, new Economic Geography.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Concepts in Economic Geography: Goods and services, production, exchange and consumption.	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Concept of economic man, theories of choices	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Economic distance and transport costs	Subhankar Patra (SP)		2	2	HoD
		Unit-2.1 Concept and classification of economic activities	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.2 Factors affecting location of economic activity with special reference to agriculture (Von Thunen), and industry (Weber).	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Primary activities: Subsistence and commercial agriculture, forestry, fishing and mining	Arpita Patra(AP)	1	2	2	HoD
		Unit-2.4 Secondary activities: Manufacturing (cotton textile, iron and steel), concept of manufacturing regions, special economic zones and technology parks	Chandan Karan(CK)		2	2	HoD
		Unit-2.5 Tertiary activities: transport, trade and services	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.6 Agricultural systems: Case studies of tea plantation in India and mixed farming in Europe	Asish Ghosh (AG)		2	2	HoD
		Unit-2.7 Transnational sea-routes, railways and highways with reference to India	Arpita Patra(AP)	1	2	2	HoD
		Unit-2.8 International agreements and trade blocs: GATT and OPEC	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

- Alexander J. W., 1963: Economic Geography, Prentice-Hall Inc., Englewood Cliffs, New Jersey.
- Coe N. M., Kelly P. F. and Yeung H. W., 2007: Economic Geography: A Contemporary Introduction, Wiley-Blackwell.
- Hodder B. W. and Lee Roger, 1974: Economic Geography, Taylor and Francis.
- Combes P., Mayer T. and Thisse J. F., 2008: Economic Geography: The Integration of Regions and Nations, Princeton University Press.
- Wheeler J. O., 1998: Economic Geography, Wiley..
- Durand L., 1961: Economic Geography, Crowell.
- Bagehi-Sen S. and Smith H. L., 2006: Economic Geography: Past, Present and Future, Taylor and Francis.
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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
IV	Core-10 (C10T, Environmental Geography)	Unit-1.1 Geographers' approach to environmental studies	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.2 Perception of environment in different stages of civilization	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Concept of holistic environment and system approach	Arpita Patra(AP)	1	3	3	HoD
		Unit-1.4 Ecosystem: Concept, structure and functions	Chandan Karan (CK)		2	2	HoD
		Unit-2.5 Environmental pollution and degradation: Land, water and air	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.6 Space-time hierarchy of environmental problems: Local, regional and global	Chandan Karan (CK)		1	1	HoD
		Unit-1.7 Urban environmental issues with special reference to waste management	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.8 Environmental programmes and policies – Global, national and local levels	Pranab Sahoo(PS)		2	2	HoD
	Core-10 (C10P, Environmental Geography Lab)	Unit-1.1 Preparation of questionnaire for perception survey on environmental problems.	Kishor Dandapat (KD)	1	1	1	HoD
		Unit-1.2 Preparation of check-list for Environmental Impact Assessment of an urban / industrial project	Subhankar Patra (SP)		1	1	HoD
		Unit-1.3 Quality assessment of soil using field kit: pH and NPK	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Interpretation of air quality using CPCB / WBPCB data	Pranab Sahoo(PS)		2	2	HoD

### Reference Books

- Chandna R. C., 2002: Environmental Geography, Kalyani, Ludhiana.
- Cunningham W. P. and Cunningham M. A., 2004: Principals of Environmental Science: Inquiry and Applications, Tata Macgraw Hill, New Delhi.
- Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
- Singh, R.B. (Eds.) (2009) Biogeography and Biodiversity. Rawat Publication, Jaipur
- Miller G. T., 2004: Environmental Science: Working with the Earth, Thomson BrooksCole, Singapore.
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- UNEP, 2007: Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme.
- Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1.
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CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical(L-T-P)	Hours	Approved
IV	SEC-2 (SEC-2T: Research Method)	Unit-1.1 Geographic Enquiry: Definition and Ethics; Literature Review; Framing Research Questions, Objectives and Hypothesis; Preparing Sample Questionnaires and inventories	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Data Collection: Type and Sources of Data; Methods of data Collection; Data Input and Editing	Chandan Karan(CK)		2	2	HoD
		Unit-1.3 Data Analysis: Qualitative and Quantitative Analysis; Techniques Data Representation	Kishor Dandapat(KD)	1	2	2	HoD
		Unit-1.4 Structure of a Research Report: Preliminaries; Text; Citation, Notes, References, Bibliography and Abstract and Key words.	Subhankar Patra(SP)		2	2	HoD

### Reference Books

- ▶ Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- ▶ Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- ▶ Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- ▶ Misra, R.P. (2002) Research Methodology, Concept Publications, New Delhi.
- ▶ Mukherjee, Neela 1993. Participatory Rural Appraisal: Methodology and Application. Concept Pubs. Co., New Delhi.
- ▶ Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Pubs. Co., New Delhi
- ▶ Robinson A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.
- ▶ Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2 (2001).
- ▶ Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
- ▶ Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.
- ▶ Yadav, H. (2013) Shodh Pravidhi Evam Matratamak Bhugol, Raja Publications, Delhi

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## Syllabus Distribution and Unit Wise Lesson Plan

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V	Core-11( C11T: Field Work and Research Methodology)	Unit-1.1 Research in Geography: Meaning, types and significance, abstract and keywords	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Literature review and formulation of research design	Subhankar Patra (SP)		2	2	HoD
		Unit-1.3 Defining research problem, objectives and hypothesis. Research materials and methods	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Techniques of writing scientific reports: Preparing notes, references, bibliography	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Fieldwork in Geographical studies – Role and significance. Selection of study area and objectives. Pre-field preparations. Ethics of fieldwork	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Field techniques and tools: Observation (participant, non participant), questionnaires (open, closed, structured, non-structured). Interview with special reverence to focused group discussions.	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Positioning and collection of samples. Preparation of inventory from field data. Post-field tasks.	Subhankar Patra (SP)		2	2	HoD
	Core-11 ( C11P: Research Methodology and Field Work Lab)	1. Each student will prepare an individual report based on primary data collected from field survey and secondary data collected from different sources for either a rural area ( <i>mouza</i> ) or an urban area (municipal ward) based on cadastral or municipal maps to study specific problems. .2. The duration of the field work shall not exceed 10 days. 3. The report should be hand written in English on A4 size paper in candidate's own words within 5,000 to 8,000 words excluding figures , tables , photographs , maps , references and appendices. 4. A copy of the bound report, duly signed by the concerned teacher, should be submitted.	Pranab Sahoo(PS) Subhankar Patra (SP) Chandan Karan (CK) Kishor Dandapat (KD)	2	8	8	HoD

### Reference Books

- Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Pubs. Co., New Delhi
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- Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.

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V	Core-12 (C12T:Remote Sensing and GIS)	Unit-1.1 Principles of Remote Sensing (RS): Types of RS satellites and sensors	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.2 Sensor resolutions and their applications with reference to IRS and Landsat missions, image referencing schemes and data acquisition.	Arpita Patra (AP)		2	2	HoD
		Unit-1.3 Preparation of False Colour Composites from IRS LISS-3 and Landsat TM and OLI data.	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.4 Principles of image interpretation. Preparation of inventories of land use land cover (LULC) features from satellite images	Arpita Patra (AP)		2	2	HoD
		Unit-2.1 GIS data structures: types (spatial and non-spatial), raster and vector	Arpita Patra (AP)	1	2	2	HoD
		Unit-2.2 Principles of preparing attribute tables, data manipulation and overlay analysis	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Principles of GNSS positioning and waypoint collection	Arpita Patra (AP)	1	2	2	HoD
		Unit-2.4 Transferring of waypoints to GIS. Area and length calculations from GNSS data.	Arpita Patra (AP)		2	2	HoD
	Core-12 (C12P:Remote Sensing and GIS Lab)	Unit-1.1 Georeferencing of maps and images	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.2 Image enhancement. Preparation of reflectance libraries of LULC features across different image bands of IRS L3 or Landsat OLI data	Arpita Patra (AP)		2	2	HoD
		Unit-1.3 Image classification, post-classification analysis and class editing	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.4 Digitisation of features. Data attachment, overlay and preparation of thematic map	Arpita Patra (AP)		2	2	HoD

### Reference Books

- Campbell J. B., 2007: Introduction to Remote Sensing, Guildford Press.
- Jensen J. R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
- Joseph, G. 2005: Fundamentals of Remote Sensing, United Press India.
- Lillesand T. M., Kiefer R. W. and Chipman J. W., 2004: Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).
- Nag P. and Kudra, M., 1998: Digital Remote Sensing, Concept, New Delhi.
- Rees W. G., 2001: Physical Principles of Remote Sensing, Cambridge University Press.
- Singh R. B. and Murai S., 1998: Space-informatics for Sustainable Development, Oxford and IBH Pub.
- Sarkar, A. (2015) Practical geography:

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CBCS (Choice Based Credit System), Session: 2021-2022

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V	DSE-1 (DSE -1T: Hydrology and Oceanography )	Unit-1.1 Systems approach in hydrology. Global hydrological cycle: Its physical and biological role	Chandan Karan (CK)	1	2	2	HoD
		Unit-1..2Run off: controlling factors. Infiltration and evapotranspiration. Run off cycle	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.3 Drainage basin as a hydrological unit. Principles of water harvesting and watershed management	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.4 Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.1 Major relief features of the ocean floor: characteristics and origin according to plate tectonics.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2Physical and chemical properties of ocean water	Arpita Patra(AP)		2	2	HoD
		Unit-2.3Water mass, T-S diagram	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Air-Sea interactions, ocean circulation, wave and tide.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.5Ocean temperature and salinity : Distribution and determinants.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Coral reefs: Formation, classification and threats.	Asish Ghosh(AG)		2	2	HoD
		Unit-2.5 Marine resources: Classification and sustainable utilisation	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.6 . Sea level change: Types and cause	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
V	DSE-2 ( DSE -2T: Social Geography )	Unit-1.1 Social Geography: Concept, Origin, Nature and Scope	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1..2 Concept of Space, Social differentiation and stratification; social processes	Arpita Patra(AP) (AG)		2	2	HoD
		Unit-1.3 Social Categories: Caste, Class, Religion, Race and Gender and their Spatial distribution	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Basis of Social region formation; Evolution of social-cultural regions of India	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.5 Peopling Process of India: Technology and Occupational Change; Migration.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.6 Social groups, social behaviour	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Concept of Social Well-being, Quality of Life, Gender and Social Well-being	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Measures of Social Well-being: Healthcare, Education, Housing, Gender Disparity	Subhankar Patra (SP)		2	2	HoD
		Unit-2.3 Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime.	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Social Planning during the Five Year Plans in India	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.5 Social Policies in India: Education and Health	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.6 Social Impact Assessment (SIA): Concept and importance	Chandan Karan (CK)		2	2	HoD

### Reference Books

- ▶ Ahmed A., 1999: Social Geography, Rawat Publications.
- ▶ Casino V. J. D., Jr., 2009) Social Geography: A Critical Introduction, Wiley Blackwell.
- ▶ Cater J. and Jones T., 2000: Social Geography: An Introduction to Contemporary Issues, Hodder Arnold.
- ▶ Holt L., 2011: Geographies of Children, Youth and Families: An International Perspective, Taylor & Francis.
- ▶ Panelli R., 2004: Social Geographies: From Difference to Action, Sage.
- ▶ Smith D. M., 1977: Human geography: A Welfare Approach, Edward Arnold, and London.
- ▶ Smith D. M., 1994: Geography and Social Justice, Blackwell, Oxford.
- ▶ Smith S. J., Pain R., Marston S. A., Jones J. P., 2009: The SAGE Handbook of Social Geographies, Sage Publications.

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V	DSE-2 (DSE -2T: Resource Geography)	Unit-1.1 Natural Resources: Concept and classification	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.2 Approaches to Resource Utilization: Utilitarian, Conservational, Community based adaptive	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Significance of Resources: Backbone of Economic growth and development	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Pressure on resources. Appraisal and Conservation on Natural Resources	Chandan Karan (CK)		2	2	HoD
		Unit-1.5 Problems of resource depletion—global scenario (forest, water, fossil fuels).	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.6 Sustainable Resource Development	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Distribution, Utilisation, Problems and Management of Metallic Mineral Resources: Iron ore, Bauxite, copper	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.2 Distribution, Utilisation, Problems and Management of Non-Metallic Mineral Resources: Limestone, Mica, Gypsum	Asish Ghosh (AG)		2	2	HoD
		Unit-2.3 Distribution, Utilisation, Problems and Management of Energy Resources: Conventional and Non-Conventional	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.4 Contemporary Energy Crisis and Future Scenario	Chandan Karan (CK)		2	2	HoD
		Unit-2.5. Politics of Power resources	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Limits to Growth and Sustainable Use of Resources; Concept of Resource sharing	Kishor Dandapat (KD)		2	2	HoD

### Reference Books

- ▶ Cutter S. N., Renwick H. L. and Renwick W., 1991: Exploitation, Conservation, And Preservation: A Geographical Perspective on Natural Resources Use, John Wiley and Sons, New York.
- ▶ Gadgil M. and Guha R., 2005: The Use and Abuse of Nature: Incorporating This Fissured Land: An Ecological History of India and Ecology and Equity, Oxford University Press. USA.
- ▶ Holechek J. L. C., Richard A., Fisher J. T. and Valdez R., 2003: Natural Resources: Ecology, Economics and Policy, Prentice Hall, New Jersey.
- ▶ Jones G. and Hollier G., 1997: Resources, Society and Environmental Management, Paul Chapman, London.
- ▶ Klee G., 1991: Conservation of Natural Resources, Prentice Hall, Englewood.
- ▶ Mather A. S. and Chapman K., 1995: Environmental Resources, John Wiley and Sons, New York.
- ▶ Mitchell B., 1997: Resource and Environmental Management, Longman Harlow, England.
- ▶ Owen S. and Owen P. L., 1991: Environment, Resources and Conservation, Cambridge University Press, New York.
- ▶ Rees J., 1990: Natural Resources: Allocation, Economics and Policy, Routledge. London

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VI	Core-13( C13T: Evolution of Geographical Thought )	Unit-1.1 Development of Geography and contributions of Greek, Chinese, and Indian geographers.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Impact of 'Dark Age' on Geography and Arab contributions	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Geography during the Age of 'Discovery' and 'Exploration' (Contributions of Portuguese Voyages, Columbus, Vasco da Gama, Magellan, Thomas Cook)	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Transition from Cosmography to Scientific Geography (Contributions of Bernard Varenius and Immanuel Kant); Dualism and Dichotomies (General vs. Particular, Physical vs. Human, Regional vs. Systematic, Determinism vs. Possibilism, Ideographic vs. Nomeothetic)	Kishor Dandapat (KD) Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Evolution of Geographical thoughts in Germany, France, Britain and United States of America.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Contributions of Humboldt and Ritter	Arpita Patra (AP)		2	2	HoD
		Unit-2.3 Contributions of Richthofen, Hettner and Ratzel	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Schools of geographical thought: French, British and American;	Asish Ghosh (AG)		2	2	HoD
		Unit-2.5 Trends of Geography in the post World War-II period	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Evolution of Geography in India: formative periods, establishments and emerging trends	Arpita Patra (AP)		2	2	HoD
Unit-2.7 Quantitative Revolution and its impact, behaviouralism, systems approach, radicalism, feminism	Kishor Dandapat (KD)	1	2	2	HoD		
Unit-2.8 Towards Post Modernism: Changing concept of space in geography. Geography in the 21st Century	Pranab Sahoo (PS)		2	2	HoD		

### Reference Books:

- ▶ Arentsen M., Stam R. and Thuijss R., 2000: Post-modern Approaches to Space, ebook.
- ▶ Bhat, L.S. (2009) Geography in India (Selected Themes). Pearson
- ▶ Bonnett A., 2008: What is Geography? Sage.
- ▶ Dikshit R. D., 1997: Geographical Thought: A Contextual History of Ideas, Prentice- Hall India.
- ▶ Hartshone R., 1959: Perspectives of Nature of Geography, Rand MacNally and Co.
- ▶ Holt-Jensen A., 2011: Geography: History and Its Concepts: A Students Guide, SAGE.
- ▶ Johnston R. J., (Ed.): Dictionary of Human Geography, Routledge.

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VI	Core-14 (C14T:Disaster Management)	Unit-1.1 Classification of hazards and disasters.	Pranab Sahoo(PS)	1	2	2	HoD
		Unit-1.2 Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms.	Kishor Dandapat(KD)		2	2	HoD
		Unit-1.3 Responses to hazards: Preparedness, trauma and aftermath. Resilience and capacity building.	Chandan Karan(CK)	1	2	2	HoD
		Unit-1.4 Hazards mapping: Data and techniques.	Subhankar Patra(SP)		2	2	HoD
		Unit-2.1 Earthquake: Factors, vulnerability, consequences and management	Subhankar Patra(SP)	1	2	2	HoD
		Unit-2.2 Landslide: Factors, vulnerability, consequences and management	Asish Ghosh(AG)		2	2	HoD
		Unit-2.3 Cyclone: Factors, vulnerability, consequences and management	Pranab Sahoo(PS)	1	2	2	HoD
		Unit-2.4 Fire: Factors, vulnerability, consequences and management	Arpita Patra (AP)		2	2	HoD
	Core-14 (C14P: Disaster Management based Project Work	An individual Project Report based on any one case study among the following disasters incorporating a preparedness plan in the vicinity of the candidate's institution or residence: 1. Thunderstorm 2. Landslide 3. Flood 4. Coastal / riverbank erosion 5. Fire 6. Industrial accident 7. Structural collapse	Pranab Sahoo(PS), Subhankar Patra(SP), Chandan Karan(CK), Kishor Dandapat(KD)	2	8	8	HoD

### Reference Books

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

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical( L -T-P)	Hours	Approved
VI	DSE-3 ( DSE -3T: Soil and Biogeography )	Unit-1.1 Factors of soil formation. Man as an active agent of soil transformation.	Asish Ghosh(AG)	1	2	2	HoD
		Unit-1.2 Soil profile. Origin and profile characteristics of Lateritic, Podzol and Chernozem soils	Asish Ghosh(AG)		2	2	HoD
		Unit-1.3 Definition and significance of soil properties: Texture, structure and moisture,	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Definition and significance of soil properties: p <sup>H</sup> , organic matter and NPK	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.5 Soil erosion and degradation: Factors, processes and mitigation measures	Pranab Sahoo (PS)	1	2	2	HoD
		Unit- 1.6 Principles of soil classification: Genetic and USDA. Concept of land capability and its classification	Subhankar Patra (SP)		2	2	HoD
		Unit-1.7 Concepts of biosphere, ecosystem, biome, ecotone, community and ecology	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.8 Concepts of trophic structure, food chain and food web. Energy flow in ecosystems	Chandan Karan (CK)		2	2	HoD
		Unit- 1.9 Geographical extent and characteristic features of: Tropical rain forest, Taiga and Grassland biomes	Subhankar Patra (SP)	1	2	2	HoD
		Unit- 1.10 Bio-geochemical cycles with special reference to carbon dioxide and nitrogen	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.11 Deforestation: Causes, consequences and management	Arpita Patra(AP)	1	2	2	HoD
		Unit- 1.12 Bio-diversity: Definition, types, threats and conservation measures	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2021-2022

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotting teacher	Credit (6)	Lecture, Tutorial, Practical( L-T-P)	Hours	Approved
VI	DSE-4 ( DSE -4T: Agricultural Geography )	Unit-1.1 Progress of Agricultural Geography with reference to allied disciplines. Approaches to study of Agricultural Geography.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Origin and dispersal of agriculture; Role of agriculture on human society.	Pranab Sahoo (PS)		2	2	HoD
		Unit-1. Factors affecting agriculture. Classification of world agricultural systems.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Location and characteristics of major agricultural types: Intensive subsistence, extensive commercial and plantation agriculture.	Arpita Patra(AP)		2	2	HoD
		Unit-2.1 Concept of cropping pattern, crop combination, gross and net cropped area, crop rotation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.2 A critical review and contemporary perspective of Von Thunen' model	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Definition and factors affecting yield. Measures of agricultural productivity	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Role of irrigation in Indian agriculture	Asish Ghosh (AG)		2	2	HoD
		Unit-2.5 Problems of agriculture with special reference to South Asian countries	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 World patterns of agricultural production and food security	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Land use survey and land classification (USDA)	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Globalization and agriculture with special reference to India	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

- ▶ Basu, D.N., and Guha, G.S., 1996: Agro-Climatic Regional Planning in India, Vol.I & II, Concept Publication, New Delhi.
- ▶ Bryant, C.R., Johnston, T.R, 1992: Agriculture in the City Countryside, Belhaven Press, London.
- ▶ Burger, A., 1994: Agriculture of the World, Aldershot, Avebury.
- ▶ Grigg, D.B., 1984: Introduction to Agricultural Geography, Hutchinson, London.
- ▶ Ilbery B. W., 1985: Agricultural Geography: A Social and Economic Analysis, Oxford University Press.
- ▶ Mohammad, N., 1992: New Dimension in Agriculture Geography, Vol. I to VIII, Concept Pub., New Delhi.
- ▶ Roling, N.G., and Wageruters, M.A.E.,(ed.) 1998: Facilitating Sustainable Agriculture, Cambridge University Press, Cambridge.
- ▶ Shafi, M., 2006: Agricultural Geography, Doring Kindersley India Pvt. Ltd., New Delhi
- ▶ Singh, J., and Dhillon, S.S., 1984: Agricultural Geography, Tata McGraw Hill, New Delhi.
- ▶ Tarrant J. R., 1973: Agricultural Geography, David and Charles, Devon.

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General  
CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
I	Core-1( CIT: Geotectonics and Geomorphology)	Unit-1.1 Earth's tectonic and structural evolution with reference to geological time scale.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Earth's interior with special reference to seismology, Isostasy: Models of Airy and Pratt.	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.3 Plate Tectonics: Processes at constructive, conservative, destructive margins and hotspots; resulting landforms	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-1.4 Folds and Fault —Origin and types	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Degradational processes: Weathering, Mass wasting and resultant landforms	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Processes of entrainment, transportation and deposition by different geomorphic agents, Role of humans in landform development	Kishor Dandapat (KD)		1	1	HoD
		Unit-2.3 Development of river network and landforms on Uniclinal and folded structures	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.4 Landforms on igneous rocks with special reference to Granite and Basalt	Arpita Patra (AP)		1	1	HoD
		Unit-2.5 Karst landforms: Surface and sub-surface and landforms, Coastal processes and landforms	Subhankar Patra (SP)	1	3	3	HoD
		Unit-2.6 Glacial and fluvio-glacial processes and landforms; fluvio-glacial landforms	Chandan Karan (CK)		2	2	HoD
		Unit-2.7 Aeolian and fluvio-aeolian processes and landforms; fluvio-aeolian processes	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Models on landscape evolution: Views of Davis , Models on landscape evolution: Views of Penck, Models on landscape evolution: Views of Hack	Pranab Sahoo (PS)		2	2	HoD

### Reference Books:

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

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General  
CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
I	Core-2(C2T, Cartographic Techniques)	Unit-1.1 Maps: Classification and types. Components of a map	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Concept and application of scales: Plain, comparative, diagonal and vernier	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Coordinate systems: Polar and rectangular. Concept of geoid and spheroid	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Concept of generating globe. Grids: angular and linear systems of measurement	Subhankar Patra (SP)		2	2	HoD
		Unit-1.5 Bearing: Magnetic and true, whole-circle and reduced.	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.6 Map projections: Classification, properties and uses. Concept and significance of UTM projection.	Pranab Sahoo (PS)		1	1	HoD
		Unit-1.7 Basic concepts of surveying and survey equipment: Prismatic compass, dumpy level, theodolite, Abney level, clinometer.	Subhankar Patra (SP) Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.8 Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps	Chandan Karan (CK)		2	2	HoD
	Core-2(C2T, Cartographic Techniques Lab)	Unit-1.1 Graphical construction of scales: Plain, comparative, diagonal and vernier	Asish Ghosh (AG)	1	2	2	HoD
		Unit-.2 Construction of projections: Polar Zenithal Stereographic, Simple conic with two standard parallels, Bonne's, Cylindrical Equal Area, and Mercator's.	Pranab Sahoo (PS) Subhankar Patra (SP)		2	2	HoD
		Unit-1.3 Delineation of drainage basin from Survey of India topographical map. Construction and interpretation of relief profiles (superimposed, projected and composite), relative relief map, slope map (Wentworth), and stream ordering (Strahler) on a drainage basin.	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Correlation between physical and cultural features from Survey of India topographical maps. using transect chart	Chandan Karan (CK)		2	2	HoD

### Reference Books

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

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
II	Core-3( C3T: Human Geography )	Unit-1.1 Nature and scope and recent trends. Elements of Human Geography	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Approaches to the study of Human Geography; Resource, Locational, Landscape, Environmental	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Evolution of humans. Concept of race and ethnicity	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Space, society and cultural regions (language and religion)	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Evolution of human societies: Hunting and food gathering, pastoral nomadism, subsistence farming, industrial and urban societies	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Human adaptation to environment: Eskimo, Masai, Jarwa, Gaddi, Santhals.	Arpita Patra(AP)		1	1	HoD
		Unit-2.3 Population growth and distribution, population composition; demographic transition model	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Population–Resource regions (Ackerman)	Chandan Karan (CK)		1	1	HoD
		Unit-2.5 Human population and environment with special reference to development–environment conflict	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-2.6 Social morphology and rural house types in India	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Types and patterns of rural settlements	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Types and patterns of urban settlements	Kishor Dandapat (KD)		2	2	HoD

### Reference Books

- Bergman, E.F (1995): Human Geography-Culture, Connections and Landscape, Prentice Hall, New Jersey
- Chisholm. (1975): Human Geography, Penguin Books, Hermondsworth.
- Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.
- Johnston R; Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.
- Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York.
- Norton. W. (2001): Human Geography, 4th Edition Oxford University press, Oxford
- Pearce D. (1995): Tourism Today: A Geographical Analysis, 2nd edition, Longman Scientific & Technical, London
- Pickering K. and Owen A. A. (1997): An Introduction to Global Environmental Issues, 2nd edition Rutledge, London.
- Raw, M. (1986): Understanding Human Geography: A Practical Approach, Bell and Hyman. London
- Rubenstein, J.M. (2002), The Cultural Landscape, 7th edition, Prentice Hall, Englewood Cliffs
- Smith D M (1982): Human Geography: A Welfare Approach, Edward Arnold, London

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
II	Core-4(C4T, Cartogram and Thematic Mapping)	Unit-1.1 Concepts of rounding, scientific notation, logarithm and anti-logarithm, natural and log scales	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Diagrammatic representation of data: Line, Bar, and Circle	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Representation of point data: Isoleths.	Pranab Sahoo (PS)	1	3	3	HoD
		Unit-1.4 Representation of area data: Dots, proportional circles and Choropleth	Subhankar Patra (SP)		2	2	HoD
		Unit-1.5 Preparation and interpretation of large scale thematic maps: Geomorphological maps	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.6 Preparation and interpretation of large scale thematic maps: Climatological maps	Subhankar Patra (SP)		1	1	HoD
		Unit-1.7 Preparation and interpretation of large scale thematic maps: Landuse landcover maps	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.8 Preparation and interpretation of large scale thematic maps: Socio-economic maps	Chandan Karan (CK)		2	2	HoD
	Core-4(C4P, Cartography Lab)	Unit-1.1 Traverse survey using Prismatic Compass	Chandan Karan(CK)	1	2	2	HoD
		Unit-.2 Levelling by Dumpy Level and Prismatic Compass	Kishor Dandapat (KD) & Subhankar Patra(SP)		2	2	HoD
		Unit-1.3 Thematic maps: Proportional squares, pie diagrams with proportional circles, dots and spheres	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Thematic maps: Choropleth, isoline map, chorochromatic map	Arpita Patra(AP) & Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
III	Core-5( C5T: Climatology)	Unit-1.1 Nature, composition and layering of the atmosphere	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.2 Isolation: controlling factors. Heat budget of the atmosphere	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Temperature: horizontal and vertical distribution. Inversion of temperature: types, causes and consequences	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Greenhouse effect and importance of ozone layer	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Condensation: Process and forms. Mechanism of precipitation: Bergeron-Findeisen theory, collision and coalescence. Forms of precipitation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.2 Air mass: Typology, origin, characteristics and modification.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.3 Fronts: warm and cold; frontogenesis and frontolysis.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.4 Weather: stability and instability; barotropic and baroclinic conditions.	Chandan Karan (CK)		2	2	HoD
		Unit-2.5 Circulation in the atmosphere: Planetary winds, jet stream, index cycle	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.6 Tropical and mid-latitude cyclones	Kishor Dandapat (KD)		2	2	HoD
Unit-2.7 Monsoon circulation and mechanism with reference to India	Pranab Sahoo (PS)	1	2	2	HoD		
Unit-2.8 Climatic classification after Köppen, Thornthwaite and Oliver	Pranab Sahoo (PS) & Kishor Dandapat (KD)		2	2	HoD		

### Suggested Readings:

- Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
- Barry R. G. and Corley R. J., 1998: Atmosphere, Weather and Climate, Routledge, New York.
- Critchfield H. J., 1987: General Climatology, Prentice-Hall of India, New Delhi
- Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey.
- Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
- Trewartha G. T. and Horne L. H., 1980: An Introduction to Climate, McGraw

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Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical ( L-T-P)	Hours	Approved
III	Core-6(C6T, Statistical methods in Geography)	Unit-1.1 Importance and significance of Statistics in Geography. Discrete and continuous data, population and samples, scales of measurement (nominal, ordinal, interval and ratio), sources of data.	Arpita Patra(AP)	1	2	2	HoD
		Unit-1.2 Collection of data and formation of statistical tables	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Sampling: Need, types, and significance and methods of random sampling	Subhankar Patra (SP)	1	3	3	HoD
		Unit-1.4 Theoretical distribution: frequency, cumulative frequency, normal and probability	Asish Ghosh (AG)		2	2	HoD
		Unit-2.1 Central tendency: Mean, median, mode, partition values	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Measures of dispersion range, mean deviation, standard deviation, coefficient of variation	Kishor Dandapat (KD)		1	1	HoD
		Unit-2.3 Association and correlation: Rank correlation, product moment correlation	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Regression (linear and non-linear ) and time series analysis (moving average)	Chandan Karan (CK)		2	2	HoD
	Core-6(C6P, Statistical methods in Geography Lab)	Unit-1.1 Construction of data matrix with each row representing an aerial unit (districts / blocks / <i>mouzas</i> / towns) and corresponding columns of relevant attributes.	Kishor Dandapat (KD)	1	1	1	HoD
		Unit-1.2 Based on the above, a frequency table, measures of central tendency and dispersion would be computed and interpreted.	Pranab Sahoo(PS)		1	1	HoD
		Unit-1.3 Histograms and frequency curve would be prepared on the dataset.	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 From the data matrix a sample set (20%) would be drawn using, random, systematic and stratified methods of sampling and locate the samples on a map with a short note on methods used.	Subhankar Patra (SP)		2	2	
		Unit-1.5 Based on of the sample set and using two relevant attributes, a scatter diagram and regression line would be plotted and residual from regression would be mapped with a short interpretation.	Chandan Karan (CK)		2	2	HoD

### Suggested Readings:

- Berry B. J. L. and Marble D. F. (eds.): Spatial Analysis – A Reader in Geography.
- Ebdon D., 1977: Statistics in Geography: A Practical Approach.
- Hammond P. and McCullagh P. S., 1978: Quantitative Techniques in Geography: An Introduction.
- King L. S., 1969: Statistical Analysis in Geography, Prentice-Hall.
- Mahmood A., 1977: Statistical Methods in Geographical Studies, Concept.
- Sarkar, A. (2013) Quantitative geography: techniques and presentations. Orient Black Swan Private Ltd., New Delhi
- Spiegel M. R.: Statistics, Schaum's Outline Series.

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
III	Core-7( C7T:Geography of India)	Unit-1.1 Tectonic and stratigraphic provinces, physiographic divisions	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.2 Climate, soil and vegetation: Characteristics and classification	Arpita Patra(AP)		2	2	HoD
		Unit-1.3 Population: Distribution, growth, structure and policy	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.4 Distribution of population by race, caste, religion, language, tribes and their correlates	Asish Ghosh (AG)		2	2	HoD
		Unit-1.5 Agricultural regions. Green revolution and its consequences	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.6 Mineral and power resources distribution and utilisation of iron ore, coal, petroleum, gas;	Chandan Karan (CK)		2	2	HoD
		Unit-1.7 Industrial development: Automobile and information technology	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.8 Regionalisation of India: Physiographic (R. L. Singh), Socio-cultural (Sopher) and Economic (Sengupta)	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Physical perspectives: Physiographic divisions, forest and water resources	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Population: Growth, distribution and human development	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Resources: Mining, agriculture and industries	Chandan Karan(CK)	1	2	2	HoD
		Unit-2.4 Regional Problem: Darjeeling Hills, Jangalmahal and Sundarban	Pranab Sahoo (PS)		2	2	HoD

### Suggested Readings:

- Deshpande C. D., 1992: India: A Regional Interpretation, ICSSR, New Delhi.
- Johnson, B. L. C., ed. 2001. Geographical Dictionary of India. Vision Books, New Delhi.
- Mandal R. B. (ed.), 1990: Patterns of Regional Geography – An International Perspective. Vol. 3 – Indian Perspective.
- Sdyasuk Galina and P Sengupta (1967): Economic Regionalisation of India, Census of India
- Sharma, T. C. 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi.
- Singh R. L., 1971: India: A Regional Geography, National Geographical Society of India.
- Singh, Jagdish 2003: India - A Comprehensive & Systematic Geography, Gyanodaya Prakashan, Gorakhpur.
- Spate O. H. K. and Learmonth A. T. A., 1967: India and Pakistan: A General and Regional Geography, Methuen.
- Tirtha, Ranjit 2002: Geography of India, Rawat Pubs., Jaipur & New Delhi.
- Pathak, C. R. 2003: Spatial Structure and Processes of Development in India. Regional Science Assoc., Kolkata.
- Tiwari, R.C. (2007) Geography of India. Prayag Pustak Bhawan, Allahabad
- Sharma, T.C. (2013) Economic Geography of India. Rawat Publication, Jaipur

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical(L-T-P)	Hours	Approved
III	SEC-1 ( SEC-1T: Coastal Management)	Unit-1.1 Components of a coastal zone. Coastal morphodynamic variables and their role in evolution of coastal forms.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Environmental impacts and management of mining, oil exploration, salt manufacturing, land reclamation and tourism.	Chandan Karan(CK)		2	2	HoD
		Unit-1.3 Coastal hazards and their management using structural and non-structural measures: Erosion, flood, sand encroachment, dune degeneration, estuarine sedimentation and pollution	Kishor Dandapat(KD) & Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.4 Principles of Coastal Zone Management. Exclusive Economic Zone and Coastal Regulation Zones with reference to India.	Subhankar Patra(SP)		2	2	HoD

### Suggested Readings:

- Carter, R.W.G (1988): Coastal Environments: An Introduction to the Physical, Ecological and Cultural Systems of Coastlines, Academic Press, London
- Dayer K.R. (1979): Estuary Hydrography, and Sedimentation, Cambridge Univ. Press, Cambridge.
- Devis R.A. (ed) (1978): Coastal Sedimentary Environmental; Springer-Verlag, New York.
- Harikawa , K. (1978): Coastal Engineering, Univ Of Tokyo Press, Tokyo.
- Inman, D.L. (1960): Shore Processes, Encyclopedia of Science & Technology, Mc Graw Hill, New York.
- Knight, B. and Philip, A. (1979): Estuarine and coastal Land reclamation and water storage, Saxon House.
- Laussn, E and Lato, I.(ed): Chemistry and Biochemistry of estuaries, Wiley, New York.
- Pethick, J. (2000): An Introduction to coastal Geomorphology, Arnold, London.
- Stanley, D.J. and Suist D.J.P.(ed)(1976): Marine Sediment Transport and environmental management;Wiley, NewYork.
- Wagret,P. (1968): Polderlands, Methuen, London.

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CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
IV	Core-8( C8T: Regional Planning and Development )	Unit-1.1 Concept of regions: Types of regions and their delineation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Types of planning, principles and objectives of regional planning, multi- level planning in India	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Tools and techniques of regional planning, need for regional planning in India	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Metropolitan concept: metropolitan areas, and urban agglomerations	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Development: Meaning, growth versus development	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Concept and strategies of regional development with reference to India	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.3 Theories and models for regional development : Growth pole model of perroux; growth centre model in Indian context	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Theories and models for regional development: Cumulative causation (Myrdal) and core periphery (Hirschman, Rostov and Friedman)	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.5 Changing concept of development, concept of underdevelopment; efficiency-equity debate	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.6 Indicators of development: Economic, social and environmental. Human development.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Regional development in India, regional inequality, disparity and diversity	Arpita Patra(AP)	1	2	2	HoD
Unit-2.8 Need and measures for balanced development in India	Arpita Patra (AP)	2	2		HoD		

### Reference Books

- Berry, B.J.L. and Horton, F.F. (1970): Geographic Perspectives on Urban Systems. Prentice Hall, New Jersey.
- Bhat L.S. (1972): Regional Planning In India, Statistical Publishing Society.
- Blij H. J. De, 1971: Geography: Regions and Concepts, John Wiley and Sons.
- Chand ,M and Puri V.K. ( 1983) : Regional planning In India , allied publishers , New Delhi
- Claval P.I, 1998: An Introduction to Regional Geography, Blackwell Publishers, Oxford and Massachusetts.
- Dickinson, R.E. (1964): City and Region, Rutledge, London.
- Friedmann J. and Alonso W. (1975): Regional Policy - Readings in Theory and Applications, MIT Press, Massachusetts.
- Gore C. G., 1984: Regions in Question: Space, Development Theory and Regional Policy, Methuen, London.
- Hall, P. (1992): Urban and Regional Planning, Routledge, London.
- Kulshetra ,S.K,( 2012) : Urban and Regional Planning in India : A hand book for Professional Practioners , Sage Publication , New Delhi

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
IV	Core-9 (C9T:Economic Geography)	Unit-1.1 Meaning and approaches to Economic Geography, new Economic Geography.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Concepts in Economic Geography: Goods and services, production, exchange and consumption.	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Concept of economic man, theories of choices	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Economic distance and transport costs	Subhankar Patra (SP)		2	2	HoD
		Unit-2.1 Concept and classification of economic activities	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.2 Factors affecting location of economic activity with special reference to agriculture (Von Thunen), and industry (Weber).	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Primary activities: Subsistence and commercial agriculture, forestry, fishing and mining	Arpita Patra(AP)	1	2	2	HoD
		Unit-2.4 Secondary activities: Manufacturing (cotton textile, iron and steel), concept of manufacturing regions, special economic zones and technology parks	Chandan Karan(CK)		2	2	HoD
		Unit-2.5 Tertiary activities: transport, trade and services	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.6 Agricultural systems: Case studies of tea plantation in India and mixed farming in Europe	Asish Ghosh (AG)		2	2	HoD
		Unit-2.7 Transnational sea-routes, railways and highways with reference to India	Arpita Patra(AP)	1	2	2	HoD
		Unit-2.8 International agreements and trade blocs: GATT and OPEC	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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IV	Core-10 (C10T, Environmental Geography)	Unit-1.1 Geographers' approach to environmental studies	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.2 Perception of environment in different stages of civilization	Pranab Sahoo (PS)		2	2	HoD
		Unit-1.3 Concept of holistic environment and system approach	Arpita Patra(AP)	1	3	3	HoD
		Unit-1.4 Ecosystem: Concept, structure and functions	Chandan Karan (CK)		2	2	HoD
		Unit-2.5 Environmental pollution and degradation: Land, water and air	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.6 Space-time hierarchy of environmental problems: Local, regional and global	Chandan Karan (CK)		1	1	HoD
		Unit-1.7 Urban environmental issues with special reference to waste management	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.8 Environmental programmes and policies – Global, national and local levels	Pranab Sahoo(PS)		2	2	HoD
	Core-10 (C10P, Environmental Geography Lab)	Unit-1.1 Preparation of questionnaire for perception survey on environmental problems.	Kishor Dandapat (KD)	1	1	1	HoD
		Unit-1.2 Preparation of check-list for Environmental Impact Assessment of an urban / industrial project	Subhankar Patra (SP)		1	1	HoD
		Unit-1.3 Quality assessment of soil using field kit: pH and NPK	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Interpretation of air quality using CPCB / WBPCB data	Pranab Sahoo(PS)		2	2	HoD

### Reference Books

- Chandna R. C., 2002: Environmental Geography, Kalyani, Ludhiana.
- Cunningham W. P. and Cunningham M. A., 2004: Principals of Environmental Science: Inquiry and Applications, Tata Macgraw Hill, New Delhi.
- Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
- Singh, R.B. (Eds.) (2009) Biogeography and Biodiversity. Rawat Publication, Jaipur
- Miller G. T., 2004: Environmental Science: Working with the Earth, Thomson BrooksCole, Singapore.
- MoEF, 2006: National Environmental Policy-2006, Ministry of Environment andForests, Government of India.
- Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India.
- Odum, E. P. et al, 2005: Fundamentals of Ecology, Ceneage Learning India.
- Singh S., 1997: Environmental Geography, Prayag Pustak Bhawan. Allahabad.
- UNEP, 2007: Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme.
- Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1.
- Singh, R.B. (1998) Ecological Techniques and Approaches to Vulnerable Environment, New Delhi, Oxford & IBH Pub.

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Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical(L-T-P)	Hours	Approved
IV	SEC-2 (SEC-2T: Research Method)	Unit-1.1 Geographic Enquiry: Definition and Ethics; Literature Review; Framing Research Questions, Objectives and Hypothesis; Preparing Sample Questionnaires and inventories	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Data Collection: Type and Sources of Data; Methods of data Collection; Data Input and Editing	Chandan Karan(CK)		2	2	HoD
		Unit-1.3 Data Analysis: Qualitative and Quantitative Analysis; Techniques Data Representation	Kishor Dandapat(KD)	1	2	2	HoD
		Unit-1.4 Structure of a Research Report: Preliminaries; Text; Citation, Notes, References, Bibliography and Abstract and Key words.	Subhankar Patra(SP)		2	2	HoD

### Reference Books

- ▶ Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- ▶ Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- ▶ Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- ▶ Misra, R.P. (2002) Research Methodology, Concept Publications, New Delhi.
- ▶ Mukherjee, Neela 1993. Participatory Rural Appraisal: Methodology and Application. Concept Pubs. Co., New Delhi.
- ▶ Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Pubs. Co., New Delhi
- ▶ Robinson A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.
- ▶ Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2 (2001).
- ▶ Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
- ▶ Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.
- ▶ Yadav, H. (2013) Shodh Pravidhi Evam Matratamak Bhugol, Raja Publications, Delhi

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## Syllabus Distribution and Unit Wise Lesson Plan

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CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
V	Core-11( C11T: Field Work and Research Methodology)	Unit-1.1 Research in Geography: Meaning, types and significance, abstract and keywords	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Literature review and formulation of research design	Subhankar Patra (SP)		2	2	HoD
		Unit-1.3 Defining research problem, objectives and hypothesis. Research materials and methods	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Techniques of writing scientific reports: Preparing notes, references, bibliography	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.1 Fieldwork in Geographical studies – Role and significance. Selection of study area and objectives. Pre-field preparations. Ethics of fieldwork	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Field techniques and tools: Observation (participant, non participant), questionnaires (open, closed, structured, non-structured). Interview with special reverence to focused group discussions.	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Positioning and collection of samples. Preparation of inventory from field data. Post-field tasks.	Subhankar Patra (SP)		2	2	HoD
	Core-11 ( C11P: Research Methodology and Field Work Lab)	1. Each student will prepare an individual report based on primary data collected from field survey and secondary data collected from different sources for either a rural area ( <i>mouza</i> ) or an urban area (municipal ward) based on cadastral or municipal maps to study specific problems. .2. The duration of the field work shall not exceed 10 days. 3. The report should be hand written in English on A4 size paper in candidate's own words within 5,000 to 8,000 words excluding figures , tables , photographs , maps , references and appendices. 4. A copy of the bound report, duly signed by the concerned teacher, should be submitted.	Pranab Sahoo(PS) Subhankar Patra (SP) Chandan Karan (CK) Kishor Dandapat (KD)	2	8	8	HoD

### Reference Books

- Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi
- Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2 (2001).
- Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
- Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.

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## Syllabus Distribution and Unit Wise Lesson Plan

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Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
V	Core-12 (C12T:Remote Sensing and GIS)	Unit-1.1 Principles of Remote Sensing (RS): Types of RS satellites and sensors	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.2 Sensor resolutions and their applications with reference to IRS and Landsat missions, image referencing schemes and data acquisition.	Arpita Patra (AP)		2	2	HoD
		Unit-1.3 Preparation of False Colour Composites from IRS LISS-3 and Landsat TM and OLI data.	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.4 Principles of image interpretation. Preparation of inventories of land use land cover (LULC) features from satellite images	Arpita Patra (AP)		2	2	HoD
		Unit-2.1 GIS data structures: types (spatial and non-spatial), raster and vector	Arpita Patra (AP)	1	2	2	HoD
		Unit-2.2 Principles of preparing attribute tables, data manipulation and overlay analysis	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Principles of GNSS positioning and waypoint collection	Arpita Patra (AP)	1	2	2	HoD
		Unit-2.4 Transferring of waypoints to GIS. Area and length calculations from GNSS data.	Arpita Patra (AP)		2	2	HoD
	Core-12 (C12P:Remote Sensing and GIS Lab)	Unit-1.1 Georeferencing of maps and images	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.2 Image enhancement. Preparation of reflectance libraries of LULC features across different image bands of IRS L3 or Landsat OLI data	Arpita Patra (AP)		2	2	HoD
		Unit-1.3 Image classification, post-classification analysis and class editing	Arpita Patra (AP)	1	2	2	HoD
		Unit-1.4 Digitisation of features. Data attachment, overlay and preparation of thematic map	Arpita Patra (AP)		2	2	HoD

### Reference Books

- Campbell J. B., 2007: Introduction to Remote Sensing, Guildford Press.
- Jensen J. R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
- Joseph, G. 2005: Fundamentals of Remote Sensing, United Press India.
- Lillesand T. M., Kiefer R. W. and Chipman J. W., 2004: Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).
- Nag P. and Kudra, M., 1998: Digital Remote Sensing, Concept, New Delhi.
- Rees W. G., 2001: Physical Principles of Remote Sensing, Cambridge University Press.
- Singh R. B. and Murai S., 1998: Space-informatics for Sustainable Development, Oxford and IBH Pub.
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V	DSE-1 (DSE -1T: Hydrology and Oceanography )	Unit-1.1 Systems approach in hydrology. Global hydrological cycle: Its physical and biological role	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Run off: controlling factors. Infiltration and evapotranspiration. Run off cycle	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.3 Drainage basin as a hydrological unit. Principles of water harvesting and watershed management	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.4 Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.1 Major relief features of the ocean floor: characteristics and origin according to plate tectonics.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Physical and chemical properties of ocean water	Arpita Patra (AP)		2	2	HoD
		Unit-2.3 Water mass, T-S diagram	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Air-Sea interactions, ocean circulation, wave and tide.	Subhankar Patra (SP)		2	2	HoD
		Unit-2.5 Ocean temperature and salinity : Distribution and determinants.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Coral reefs: Formation, classification and threats.	Asish Ghosh (AG)		2	2	HoD
		Unit-2.5 Marine resources: Classification and sustainable utilisation	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.6 . Sea level change: Types and cause	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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V	DSE-2 ( DSE -2T: Social Geography )	Unit-1.1 Social Geography: Concept, Origin, Nature and Scope	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1..2 Concept of Space, Social differentiation and stratification; social processes	Arpita Patra(AP) (AG)		2	2	HoD
		Unit-1.3 Social Categories: Caste, Class, Religion, Race and Gender and their Spatial distribution	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Basis of Social region formation; Evolution of social-cultural regions of India	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.5 Peopling Process of India: Technology and Occupational Change; Migration.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.6 Social groups, social behaviour	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Concept of Social Well-being, Quality of Life, Gender and Social Well-being	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.2 Measures of Social Well-being: Healthcare, Education, Housing, Gender Disparity	Subhankar Patra (SP)		2	2	HoD
		Unit-2.3 Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime.	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Social Planning during the Five Year Plans in India	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.5 Social Policies in India: Education and Health	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.6 Social Impact Assessment (SIA): Concept and importance	Chandan Karan (CK)		2	2	HoD

### Reference Books

- ▶ Ahmed A., 1999: Social Geography, Rawat Publications.
- ▶ Casino V. J. D., Jr., 2009) Social Geography: A Critical Introduction, Wiley Blackwell.
- ▶ Cater J. and Jones T., 2000: Social Geography: An Introduction to Contemporary Issues, Hodder Arnold.
- ▶ Holt L., 2011: Geographies of Children, Youth and Families: An International Perspective, Taylor & Francis.
- ▶ Panelli R., 2004: Social Geographies: From Difference to Action, Sage.
- ▶ Smith D. M., 1977: Human geography: A Welfare Approach, Edward Arnold, and London.
- ▶ Smith D. M., 1994: Geography and Social Justice, Blackwell, Oxford.
- ▶ Smith S. J., Pain R., Marston S. A., Jones J. P., 2009: The SAGE Handbook of Social Geographies, Sage Publications.

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# SEVA BHARATI MAHAVIDYALAYA

## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
V	DSE-2 (DSE -2T: Resource Geography)	Unit-1.1 Natural Resources: Concept and classification	Asish Ghosh (AG)	1	2	2	HoD
		Unit-1.2 Approaches to Resource Utilization: Utilitarian, Conservational, Community based adaptive	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Significance of Resources: Backbone of Economic growth and development	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-1.4 Pressure on resources. Appraisal and Conservation on Natural Resources	Chandan Karan (CK)		2	2	HoD
		Unit-1.5 Problems of resource depletion—global scenario (forest, water, fossil fuels).	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.6 Sustainable Resource Development	Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Distribution, Utilisation, Problems and Management of Metallic Mineral Resources: Iron ore, Bauxite, copper	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.2 Distribution, Utilisation, Problems and Management of Non-Metallic Mineral Resources: Limestone, Mica, Gypsum	Asish Ghosh (AG)		2	2	HoD
		Unit-2.3 Distribution, Utilisation, Problems and Management of Energy Resources: Conventional and Non-Conventional	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.4 Contemporary Energy Crisis and Future Scenario	Chandan Karan (CK)		2	2	HoD
		Unit-2.5. Politics of Power resources	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Limits to Growth and Sustainable Use of Resources; Concept of Resource sharing	Kishor Dandapat (KD)		2	2	HoD

### Reference Books

- ▶ Cutter S. N., Renwick H. L. and Renwick W., 1991: Exploitation, Conservation, And Preservation: A Geographical Perspective on Natural Resources Use, John Wiley and Sons, New York.
- ▶ Gadgil M. and Guha R., 2005: The Use and Abuse of Nature: Incorporating This Fissured Land: An Ecological History of India and Ecology and Equity, Oxford University Press. USA.
- ▶ Holechek J. L. C., Richard A., Fisher J. T. and Valdez R., 2003: Natural Resources: Ecology, Economics and Policy, Prentice Hall, New Jersey.
- ▶ Jones G. and Hollier G., 1997: Resources, Society and Environmental Management, Paul Chapman, London.
- ▶ Klee G., 1991: Conservation of Natural Resources, Prentice Hall, Englewood.
- ▶ Mather A. S. and Chapman K., 1995: Environmental Resources, John Wiley and Sons, New York.
- ▶ Mitchell B., 1997: Resource and Environmental Management, Longman Harlow, England.
- ▶ Owen S. and Owen P. L., 1991: Environment, Resources and Conservation, Cambridge University Press, New York.
- ▶ Rees J., 1990: Natural Resources: Allocation, Economics and Policy, Routledge. London

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# SEVA BHARATI MAHA VIDYALAYA

## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
VI	Core-13( C13T: Evolution of Geographical Thought )	Unit-1.1 Development of Geography and contributions of Greek, Chinese, and Indian geographers.	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.2 Impact of 'Dark Age' on Geography and Arab contributions	Asish Ghosh (AG)		2	2	HoD
		Unit-1.3 Geography during the Age of 'Discovery' and 'Exploration' (Contributions of Portuguese Voyages, Columbus, Vasco da Gama, Magellan, Thomas Cook)	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Transition from Cosmography to Scientific Geography (Contributions of Bernard Varenius and Immanuel Kant); Dualism and Dichotomies (General vs. Particular, Physical vs. Human, Regional vs. Systematic, Determinism vs. Possibilism, Ideographic vs. Nomeothetic)	Kishor Dandapat (KD) Pranab Sahoo (PS)		2	2	HoD
		Unit-2.1 Evolution of Geographical thoughts in Germany, France, Britain and United States of America.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-2.2 Contributions of Humboldt and Ritter	Arpita Patra (AP)		2	2	HoD
		Unit-2.3 Contributions of Richthofen, Hettner and Ratzel	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.4 Schools of geographical thought: French, British and American;	Asish Ghosh (AG)		2	2	HoD
		Unit-2.5 Trends of Geography in the post World War-II period	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 Evolution of Geography in India: formative periods, establishments and emerging trends	Arpita Patra (AP)		2	2	HoD
Unit-2.7 Quantitative Revolution and its impact, behaviouralism, systems approach, radicalism, feminism	Kishor Dandapat (KD)	1	2	2	HoD		
Unit-2.8 Towards Post Modernism: Changing concept of space in geography. Geography in the 21st Century	Pranab Sahoo (PS)		2	2	HoD		

### Reference Books:

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

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical (L-T-P)	Hours	Approved
VI	Core-14 (C14T:Disaster Management)	Unit-1.1 Classification of hazards and disasters.	Pranab Sahoo(PS)	1	2	2	HoD
		Unit-1.2 Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms.	Kishor Dandapat(KD)		2	2	HoD
		Unit-1.3 Responses to hazards: Preparedness, trauma and aftermath. Resilience and capacity building.	Chandan Karan(CK)	1	2	2	HoD
		Unit-1.4 Hazards mapping: Data and techniques.	Subhankar Patra(SP)		2	2	HoD
		Unit-2.1 Earthquake: Factors, vulnerability, consequences and management	Subhankar Patra(SP)	1	2	2	HoD
		Unit-2.2 Landslide: Factors, vulnerability, consequences and management	Asish Ghosh(AG)		2	2	HoD
		Unit-2.3 Cyclone: Factors, vulnerability, consequences and management	Pranab Sahoo(PS)	1	2	2	HoD
		Unit-2.4 Fire: Factors, vulnerability, consequences and management	Arpita Patra (AP)		2	2	HoD
	Core-14 (C14P: Disaster Management based Project Work	An individual Project Report based on any one case study among the following disasters incorporating a preparedness plan in the vicinity of the candidate's institution or residence: 1. Thunderstorm 2. Landslide 3. Flood 4. Coastal / riverbank erosion 5. Fire 6. Industrial accident 7. Structural collapse	Pranab Sahoo(PS), Subhankar Patra(SP), Chandan Karan(CK), Kishor Dandapat(KD)	2	8	8	HoD

### Reference Books

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

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotted Teachers	Credit (6)	Lecture, Tutorial, Practical( L -T-P)	Hours	Approved
VI	DSE-3 ( DSE -3T: Soil and Biogeography )	Unit-1.1 Factors of soil formation. Man as an active agent of soil transformation.	Asish Ghosh(AG)	1	2	2	HoD
		Unit-1.2 Soil profile. Origin and profile characteristics of Lateritic, Podzol and Chernozem soils	Asish Ghosh(AG)		2	2	HoD
		Unit-1.3 Definition and significance of soil properties: Texture, structure and moisture,	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.4 Definition and significance of soil properties: p <sup>H</sup> , organic matter and NPK	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.5 Soil erosion and degradation: Factors, processes and mitigation measures	Pranab Sahoo (PS)	1	2	2	HoD
		Unit- 1.6 Principles of soil classification: Genetic and USDA. Concept of land capability and its classification	Subhankar Patra (SP)		2	2	HoD
		Unit-1.7 Concepts of biosphere, ecosystem, biome, ecotone, community and ecology	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-1.8 Concepts of trophic structure, food chain and food web. Energy flow in ecosystems	Chandan Karan (CK)		2	2	HoD
		Unit- 1.9 Geographical extent and characteristic features of: Tropical rain forest, Taiga and Grassland biomes	Subhankar Patra (SP)	1	2	2	HoD
		Unit- 1.10 Bio-geochemical cycles with special reference to carbon dioxide and nitrogen	Kishor Dandapat (KD)		2	2	HoD
		Unit-1.11 Deforestation: Causes, consequences and management	Arpita Patra(AP)	1	2	2	HoD
		Unit- 1.12 Bio-diversity: Definition, types, threats and conservation measures	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

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

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## Syllabus Distribution and Unit Wise Lesson Plan

Department of Geography, B.Sc. Honours/General

CBCS (Choice Based Credit System), Session: 2022-2023

Semester	Course Type with Course Title	Syllabus and Unit distribution	Allotting teacher	Credit (6)	Lecture, Tutorial, Practical( L-T-P)	Hours	Approved
VI	DSE-4 ( DSE -4T: Agricultural Geography )	Unit-1.1 Progress of Agricultural Geography with reference to allied disciplines. Approaches to study of Agricultural Geography.	Chandan Karan (CK)	1	2	2	HoD
		Unit-1.2 Origin and dispersal of agriculture; Role of agriculture on human society.	Pranab Sahoo (PS)		2	2	HoD
		Unit-1. Factors affecting agriculture. Classification of world agricultural systems.	Subhankar Patra (SP)	1	2	2	HoD
		Unit-1.4 Location and characteristics of major agricultural types: Intensive subsistence, extensive commercial and plantation agriculture.	Arpita Patra(AP)		2	2	HoD
		Unit-2.1 Concept of cropping pattern, crop combination, gross and net cropped area, crop rotation.	Chandan Karan (CK)	1	2	2	HoD
		Unit-2.2 A critical review and contemporary perspective of Von Thunen' model	Kishor Dandapat (KD)		2	2	HoD
		Unit-2.3 Definition and factors affecting yield. Measures of agricultural productivity	Kishor Dandapat (KD)	1	2	2	HoD
		Unit-2.4 Role of irrigation in Indian agriculture	Asish Ghosh (AG)		2	2	HoD
		Unit-2.5 Problems of agriculture with special reference to South Asian countries	Pranab Sahoo (PS)	1	2	2	HoD
		Unit-2.6 World patterns of agricultural production and food security	Subhankar Patra (SP)		2	2	HoD
		Unit-2.7 Land use survey and land classification (USDA)	Asish Ghosh (AG)	1	2	2	HoD
		Unit-2.8 Globalization and agriculture with special reference to India	Pranab Sahoo (PS)		2	2	HoD

### Reference Books

- ▶ Basu, D.N., and Guha, G.S., 1996: Agro-Climatic Regional Planning in India, Vol.I & II, Concept Publication, New Delhi.
- ▶ Bryant, C.R., Johnston, T.R, 1992: Agriculture in the City Countryside, Belhaven Press, London.
- ▶ Burger, A., 1994: Agriculture of the World, Aldershot, Avebury.
- ▶ Grigg, D.B., 1984: Introduction to Agricultural Geography, Hutchinson, London.
- ▶ Ilbery B. W., 1985: Agricultural Geography: A Social and Economic Analysis, Oxford University Press.
- ▶ Mohammad, N., 1992: New Dimension in Agriculture Geography, Vol. I to VIII, Concept Pub., New Delhi.
- ▶ Roling, N.G., and Wageruters, M.A.E.,(ed.) 1998: Facilitating Sustainable Agriculture, Cambridge University Press, Cambridge.
- ▶ Shafi, M., 2006: Agricultural Geography, Doring Kindersley India Pvt. Ltd., New Delhi
- ▶ Singh, J., and Dhillon, S.S., 1984: Agricultural Geography, Tata McGraw Hill, New Delhi.
- ▶ Tarrant J. R., 1973: Agricultural Geography, David and Charles, Devon.

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