COURSE OBJECTIVES & OUTCOMES OF 3/4 YEAR UNDER GRADUATE CURRICULUM IN GEOGRAPHY

NISTARINI COLLEGE, PURULIA

AFFILIATED TO

SIDHO-KANHO-BIRSHA UNIVERSITY, PURULIA, WEST BENGAL

GEOGRAPHY (MAJOR) UG SYLLABUS FOR NEP 2020

SEMESTER –I

COURSE TITLE: Introduction to Physical Geography & Elementary Practicals in Geography
COURSE CODE: BGEOMAJ01C
CREDIT: 6 (THEORY: 4 + PRACTICAL: 2)

MAJOR – 1: THEORY	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Our Earth and the Physical Environment [26 Hours] 1.1 Interior of the Earth; Earth's tectonic and structural evolution through Geological Time Scale (6 lectures) 1.2 Earth's atmosphere: Insolation; Pressure Belts; Planetary wind System; Greenhouse Effect and Global Warming. (8) 1.3 Earth's hydrosphere: Global hydrological cycle; Ocean circulation – major ocean currents. (4 lectures) 1.4 Earth's Biosphere: Biogeographical realms of the world; Soils – Zonal, Azonal and Intrazonal; Classification of forest (Champion). (8 lectures)	**The course offers a basic understanding about the principal characteristics of the physical environment of the Earth.** **To understand the evolution of landscape and landforms over time.**	**The students will be able to identify different landscape evolved from different geomorphic processes.** **Student will be able to explain and interpret different land forms of the earth.**
Unit II: Landforms and Landscape [26 Hours] **2.1** Landforms: Types & Order. Concept & Theory of Isostasy (Airy & Pratt). Geomorphic Processes (6 lectures) 2.2 Landforms due to Endogenic forces: Plate Tectonics and associated Landforms; Seismicity & Vulcanicity; Landform evolution in Uniclinal, Folded and Faulted structure (8 lecture) 2.3 Landforms due to Exogenic Processes: Weathering & Mass Movement (4 lectures) 2.4 Fluvial, Glacial, Aeolian, Coastal and Karst landscapes; Landscape evolution models: Davis, Penck and Hack (8 lectures)		

References:

1. Singh, Savindra 2020 Physical Geography. Pravalika Publications
2. Frisch, W., Meschede, M., Blakey, R.C. 2011. Plate Tectonics: Continental Drift and Mountain Building. Springer.
3. Goudie, A.S. (Ed) 2004. Encyclopedia of Geomorphology, vol. 1 and 2, Routledge.
4. Kale, V.S., Gupta, A. 2001. Introduction to Geomorphology, Orient Longman.
5. Selby, M.J. 1986. Earth's Changing Surface, Oxford University Press.

MAJOR – 1: PRACTICAL	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Scale, Minerals and Rocks [22 Hours] 1.1 Concept and classification of Map Scales 1.2 Construction and use of scales: Simple linear, Comparative linear, Diagonal and Vernier 1.3 Megascopic identification of Mineral samples: Bauxite, Calcite, Chalcopyrite, Feldspar, Galena, Gypsum, Hematite, Magnetite, Mica, Quartz, Talc, Tourmaline 1.4 Megascopic identification of Rock samples: Granite, Basalt, Dolerite, Laterite, Limestone, Shale, Sandstone, Conglomerate, Slate, Phyllite, Schist, Gneiss, Quartzite, Marble.	**To understand the idea of different types of Map Scale.**	**Students will learn about the application of scale in geographic studies.**
Unit II: Interpretation of Geological Map [30 Hours] 2.1 Basic ideas and conventional symbols. Choice of section line; series and unconformity; strike and dip; topography; rules of three-point problems for measuring dip. 2.2 Drawing of geological section - Horizontal, Uniclinal with unconformity, and Simple folded structure. 2.3 Interpretation of geological section based on a) topography; b) sequence of beds; c) attitude of beds d) structure of beds e) correlation between structure and topography; f) geological history **Project File** a) Construction of Scales: Simple linear, Comparative scale, Diagonal & Vernier. b) Identification of Minerals and Rocks. c) Drawing and interpretation of geological section - Horizontal, Uniclinal with unconformity, & Simple folded structure.		
References: 1. Basak, N.N. 2017. Surveying and Levelling, 2nd ed, McGraw Hill Education. 2. Kanetkar, T.P., Kulkatni, S.V. 1988. Surveying and Levelling, Part I, Pune Vidyarthi Griha Prakashan. 3. Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan Pvt. Ltd.		

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END OF SEMESTER – I

SEMESTER –II

COURSE TITLE: Introduction to Human Geography & Map Projection and Topographical Sheet
COURSE CODE: BGEOMAJ02C)
CREDIT: 6 (THEORY: 4 + PRACTICAL: 2)

MAJOR – 2: THEORY	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Fundamentals of Human Geography [26 Hours] **1.1** Nature, scope and development of human geography. 1.2 Evolution of Man-Nature interaction: Hunting and Food gathering, Pastoral nomadism, Agrarian society and industrial society. Man-environment relationship in Equatorial, Monsoon, Tundra and Hot desert regions. 1.3 Race and ethnic groups: Concept, origin and distribution. 1.4 Language, religion and culture: Origin, diffusion and distribution	**To have a comprehensive understanding of human aspects of geographical phenomena and their interface.** **To introduce the different dimensions related to population, culture, and settlement.**	**Students will have a better understanding of the man-environment relation, from local to global scale.** **Students will be able to understand various contemporary developmental issues.**
Unit II: Population, Settlement and Development [26 Hours] 2.1 Population geography and demography. Population growth and composition. 2.2 Types and patterns of rural and urban settlement. Morphology of Urban settlement. 2.3 Poverty and Food Security. Natural hazards and Environmental refugee. 2.4 Indicators of social well-being; Human Development, Sustainable Development Goals.		

References:

1. Blij, H.D. 1992. Human and Economic Geography, Macmillan Publishing Company.
2. Hussain, M. 2003. Human Geography, Rawat Publications, Jaipur.
3. Leong, G.C. 1997. Human and Economic Geography, Oxford University.
4. Singh, L.R. 2005. Fundamentals of Human Geography, Sharda Pustak Bhawan, Allahabad.

MAJOR – 2: PRACTICAL	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Map Projection [26 Hours] **1.1** Concept of Geoid and Spheroid; Datum with special reference to Everest and WGS-84 Coordinate systems: geographic, projected and local. 1.2 Concept of generating globe; Grids: Angular and linear systems of measurement. Bearing: Magnetic and true, whole-circle and reduced, Map projections: Classification, properties and uses. 1.3 Concept and significance of UTM projection 1.4 Polar Zenithal Gnomonic and Stereographic, Simple conic with one standard parallel, Bonne's, Cylindrical Equal Area, and Mercator's	**To understand the idea of different types of Map projections.**	**Students will learn about the map projection.** **Students will analyze and interpret the topographical maps.**

Unit II: Interpretation of Topographical Map [26 Hours] 2.1 Numbering systems in Topographical map (Metric and OSM). 2.2 Extraction and interpretation of geomorphic information: Construction of relief profiles (superimposed, projected and composite), and identification of micro landform features 2.3 Delineation of drainage basins: Relative relief map, slope map (Wentworth's method), drainage density map, stream ordering (Strahler) and bifurcation ratio on a drainage basin. 2.4 Transect chart. **Project File** a) Construction of projections: Polar Zenithal Gnomonic and Stereographic, Simple conic with One Standard parallel, Bonne's, Cylindrical Equal Area, and Mercator's. b) Develop Broad Physiographic Divisions, Construction of Relief profiles (superimposed, projected and composite). c) Preparation of relative relief map, slope map, drainage density map, and stream ordering on a drainage basin. d) Correlate Physical aspects with Cultural landscape using Schematic Map, Transect chart.		
References: 1. Manual, International Cartographic Association, Elsevier Science Publishers.. 2. Mishra, R.P., Ramesh, A. 1989. Fundamentals of Cartography, Concept, New Delhi.. 3. Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan Private Ltd. 4. Singh, R.L., Singh, R.P.B. 1999. Elements of Practical Geography, Kalyani Publishers.		

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END OF SEMESTER – II

SEMESTER –III

COURSE TITLE: Introduction to Climate, Soil and Biogeography & Geographical Survey through Instruments

COURSE CODE: BGEOMAJ03C

CREDIT: 6 (THEORY: 4 + PRACTICAL: 2)

MAJOR – 3: THEORY	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Introduction to Climatology [26 Hours] **1.1** Concept of atmospheric sciences; Composition and Structure of the Atmosphere; Forms of Energy in the Atmosphere. (5 lectures) 1.2 Insolation and its influencing factors; Global Heat Budget; Horizontal and Vertical distribution of Temperature. (5 lectures) 1.3 Concept of Atmospheric Pressure; Pressure belts; factors influencing Air Motion; General Wind Circulation of the atmosphere with reference to Tri-cellular model and Jet stream. 1.4 Condensation, Precipitation, classification of climate (Koppen & Thornthwaite) (8 lectures)	**To introduce about basic concepts of climate, soil and biogeography.** **To perceive the spatial distribution of biotic and abiotic components.**	**Students will develop fundamental understandings of the atmosphere.** **Students can evaluate different aspects of floral and faunal distribution on the earth.**
Unit II: Introduction to Soil and Bio Geography [26 Hours] 2.1 Soil as a natural body; Physical and chemical properties of soils; Soil forming factors; Profile development (6 lectures) 2.2 Development of Soils: Laterite, Podzol, and Chernozem soil. Soil classification: genetic and USDA. Soil degradation and management. .(6 lectures) 2.3 Concepts and principles of ecology. Components of ecosystem; Ecosystem Hierarchy: individual, population, species, community. Concept and type of Trophic structure; food chain, food web; energy flow models in ecosystem. (7 lectures) 2.4 Biomes: Tropical Rain Forest, Grassland and Taiga. Bio-geochemical cycles: oxygen, carbon and nitrogen. Biodiversity: types, significance, threats and conservation (7 lectures)		

References:

1. Lal, D.S. (2006). Climatology. Chaitanya Publishing House.
2. Siddhartha, K. (2012). Atmosphere, Weather and Climate: A Text Book of Climatology. Kisalaya Publications Pvt. Ltd.
3. Oliver, J.E., and J. J. Hidore, J.J. (2011). Climatology: An Atmospheric Science,. Pearson.
4. Wild, A. (2006). Soils and the Environment.. Cambridge University Press.
5. Brady, N.C., and R. R. Weil, R.R. (1996). The Nature and Properties of Soils,. Prentice-Hall, Inc.

MAJOR – 3: PRACTICAL	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Weather Instruments and Soil-Water Analysis [20 Hours] 1.1 Six's Maximum & Minimum Thermometer, Barometer and Hygrometer. (5 lectures) 1.2 Climograph (After G. Talyor), Identification of Continental-Maritime Climate from Climatic data/ Graph, Synoptic Chart. (5 lectures) 1.3 Collection of soil samples from field and develop Soil Nutrient Map. (5 lectures) 1.4 Collection of water samples from field and develop Water Quality Map. (5 lectures)	**Able to record weather data, and analyze soil and water quality.** **To learn about surveying and leveling techniques t**	**Students will be able to analyze soil and water quality, and suggest measures for the sustainable use of resources.**
Unit II: Relief and Height Determination [32 Hours] 2.1 Definition scope and type of surveying, Survey instrument to measure angle direction, area and distance of object on ground. Measurement and mapping of a plot by Chain Survey (6 lectures) 2.2 Prismatic compass: The instrument; Method of taking reading; correction of data observed; Open traverse; plotting; closed traverse; plotting; correction of plotting error (Bowditch's correction); interior angles and whole circle bearing; calculation of area of closed traverse; advantages and disadvantages. (8 lectures) 2.3 Leveling: definition; instrument used; dumpy level; the staff; taking reading through a dumpy level, determination of reduced level by rise and fall method and by collimation method; checking of data; plotting of data; drawing of profile. Contouring: contouring by radial lines; contouring by cross sections. (10 lectures) 2.4 Theodolite: components; measurement of article angles; measurement of horizontal angle (only for traversing); Measurement of high transistence-1. Base accessible. 2. Base inaccessible – (a) same vertical plan and (b) oblique plan methods (8 lectures) **Project File** a) Recording and tabulation of data on atmospheric temperature, pressure and humidity. Construction and interpretation of Climograph. Preparation of synoptic chart. b) Preparation of soil nutrient map and water quality map based on primary data collection. c) Mapping a Closed Traverse by Prismatic Compass, Profile and Contouring by Dumpy Level d) Determination of Height of an Object by Theodolite survey.		
References: 1. Manual, International Cartographic Association, Elsevier Science Publishers. 2. Mishra, R.P., Ramesh, A. 1989. Fundamentals of Cartography, Concept, New Delhi. 3. Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed. Orient Blackswan Private Ltd. 4. Singh, R.L., Singh, R.P.B. 2008. Elements of Practical Geography, Kalyani Publishe		

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END OF SEMESTER – III

SEMESTER –IV **COURSE TITLE: Resource and Population & Thematic and Cadastral Mapping** **COURSE CODE: BGEOMAJ04C** **CREDIT: 6 (THEORY: 4 + PRACTICAL: 2)**		
MAJOR – 4: THEORY	**COURSE OBJECTIVE**	**COURSE OUTCOMES**
Unit I: Resource and Economic Activities [24 Hours] 1.1 Concept and classification of resources; Functional theory of resource; Conservation and management of resources; Classification of economic activities (6 lectures) 1.2 Primary activities: Agriculture (subsistence and commercial agriculture), Forestry, Fishing and Mining. Von Thunen's Model of Agriculture Location. (6 lectures) 1.3 Secondary activities: Manufacturing (Cotton textile, Iron and Steel, Petrochemical), SEZ, Theory of Industrial Location (Weber). (6 lectures) 1.4 Tertiary activities: Transport and trade; Role of WTO, IMF and World Bank (6 lectures)	**To make the students aware about the importance of resources and its utilization.** **To educate the students about the variations in economic activities.** **To educate students about changing spatial patterns, growth, determinants, theories, and policies of population geography.**	**Students will achieve an understanding of different types resources and their judicious and sustainable utilization.** **Students will be able to analyze the variations in economic activities, and evaluate a couple of models describing the location of such a**
Unit II: Population Geography [28 Hours] 2.1 Concept and scope of population geography; Determinants and factors of population growth and distribution. (6 lectures) 2.2 Trend of population growth in the world and India; Concept of fertility, mortality and migration. (8 lectures) 2.3 Theories of population growth: Malthus, Marx and Demographic Transition Model. (8 lectures) 2.4 Population policies in developing counties with special references to India. (6 lectures)		
References: 1. Hassan, M.I. 2020. Population Geography: A Systematic Exposition, Routledge 2. Bhende, A.A. Kanitkar, T. 2011. Principles of Population Studies, Himalaya Publishing House, New Delhi. 3. Maurya, S.D. 2017. Population Geography, Pravalika Publication, Allahabad. 4. Chandna, R.C. 2015. Geography of Populations, Kalyani Publishers. 5. Alexander, J.W. 1963. Economic Geography, Prentice-Hall Inc., Englewood Cliffs, New Jersey.		
MAJOR – 4: PRACTICAL	**COURSE OBJECTIVE**	**COURSE OUTCOMES**
Unit I: Thematic Mapping: Fundamental Concept [20 Hours] 1.1 Concepts of rounding, scientific notation, logarithm and anti-logarithm, natural and log	**To educate the students about the cartographic**	**Students will able draw diagram, thematic**

scales. (5 lectures) 1.2 Cartography: meaning, rules and methods of geographical data representation. (5 lectures) 1.3 Types of diagrams, graph, distribution maps and cartogram. (5 letures) 1.4 Concept of Large-scale thematic maps (5 lectures)	**techniques, thematic mapping.**	**mapping and cadastral mapping.**
Unit II: Thematic Mapping: Database Application [32 Hours] 2.1 Point and Line Symbol: Size of Dots, Flow Map (6 lectures) 2.2 Area Symbol: Pie Diagram (6 lectures) 2.3 Volume Symbol: Sphere Map (6 lectures) 2.4 Geomorphological maps from Toposheet and Cadastral map: Identification of plots and verification in the field (14 lectures) **Project File** a) Preparation of Dot map (Population Size) and Flow Diagram (Traffic/ Goods Flow) b) Develop Comparative Pie Diagram (Area related issues) and Sphere Map (Urban Population). c) Mapping Geomorphological maps from Toposheet d) Cadastral map: Identification of plots and verification in the field.		
References: 1. Manual, International Cartographic Association, Elsevier Science Publishers. 2. Mishra, R.P., Ramesh, A. 1989. Fundamentals of Cartography, Concept, New Delhi. 3. Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed. Orient Blackswan Private Ltd.		

SEMESTER –IV

COURSE TITLE: Statistical Techniques in Geography
COURSE CODE: BGEOMAJ05S
CREDIT: 6 (PRACTICAL)

MAJOR – 5: PRACTICAL	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Univariate Analysis [70 Hours] 1.1 Data and Information, Data type, Scale of measurements, Sources of data, Data collection methods, Classification and Tabulation of data. (18 lectures) 1.2 Frequency distribution: Histogram, Frequency Curve, Frequency Polygon, Cumulative Frequency, Ogive. (18 lectures) 1.3 Central tendency: Mean (arithmetic, geometric, and harmonic), Median, Mode; Partition Values. (17 lectures) 1.4 Measures of Dispersion: Range, Mean Deviation, Standard Deviation, Coefficient of Variation and Moments. Shape and Spread:	**Obtain knowledge on fundamental concepts of statistics.** **Understand the computation of univariate and bivariate statistical analysis of geographical data.**	**Students will be able to apply statistical techniques in geographical inquiry.** **Student will be able to understand the methods and**

Skewness, Kurtosis. (17 lectures) **Unit II: Bivariate Analysis [86 Hours]** 2.1 Association and correlation: Rank correlation, product moment correlation. (15 lectures) 2.2 Regression: Linear, Curvilinear, Parabolic and Geometric. (25 lectures) 2.3 Z-score, Residuals and Standard Error of Estimates. (20 lectures) 2.4 Time series analysis: Secular trend, Seasonal variation, Cyclical variation, Irregular variation, Semi-average, Moving average, Parabola. (26 lectures) **Project File** a) Frequency distribution table (ungrouped and grouped data): equal and unequal class; histogram; frequency polygon; ogive; graphical representation of mean, median, mode, quartile and percentile. b) Measures of dispersion: mean deviation, standard deviation and coefficient of variation. c) Correlation (Pearson and Spearman); Scatter diagram and plotting best-fit line using least-square method (linear); Z-score and Residual mapping. d) Time series analysis using Semi average, Moving average and least square.	**Acquire knowledge about the process of interpretation of quantitative data.**	**techniques of data collection, organization, and analysis.** **Student will be able to present scientific arguments based on quantitative knowledge.**
References: 1. S. N. Pillai and Bagavathi (2007). Statistics: Theory and Practice. S. Chand Company Ltd. 2. N. G. Das (2017). Statistical Methods (Combined Edition). McGraw Hill Education Pvt. Ltd. 3. G. B. Wetherill (1972). Elementary Statistical Methods. Springer.		

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END OF SEMESTER – IV

SEMESTER –V

COURSE TITLE: Hydrology and Oceanography
COURSE CODE: BGEOMAJ06T
CREDIT: 6 (THEORY)

MAJOR – 6: THEORY	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Fundamentals of Hydrology [26 Hours] 1.1 Definition, scope, content and evolution of hydrology. (4 lectures) 1.2 Surface and sub-surface hydrology: Interception, depression storage, infiltration and runoff -controlling factors; Runoff cycle. (8 lectures) 1.3 Drainage basin as a hydrological unit; Inter-basin water transfer. (6 lectures) 1.4 Groundwater: Occurrence, storage and movement; factors controlling recharge and discharge; aquifer properties (8 lectures)	**To focus on the fundamental hydrological components for environmental measurements.** **To brings out the elementary physical and chemical components of oceanography**	**Students will be able to apply concepts and instruments for the measurement of different hydrological parameters.** **Students will be able to understand and explain about the causes and consequences of different marine issues and hazards.**
Unit II: Applied Hydrology [26 Hours] 2.1 Concept and types of water harvesting. (6 lectures 2.2 Groundwater contamination and management. 6 lectures 2.3 Principles of micro-watershed management. 6 lectures 2.4 Water resource crisis, conflict and management. 8 lectures		
Unit III: Fundamentals of Oceanography [26 Hours] 3.1 Major relief features of the ocean floor; Origin of oceans: seafloor spreading and plate tectonics. (6 lectures) 3.2 Physical and chemical properties of ocean water. Movements of ocean water: waves and tides (6 lectures) 3.3 Marine resources: Classification and sustainable utilization. Marine pollution: Causes, types & mitigation. (6 lectures) 3.4 Coral reefs: Theories of formation (Darwin and Daly), classification and threats. (8 lectures)		

Selected References:

1. Dingman, S.L. 2015. Physical Hydrology, 3rd ed, Macmillan Publishing Co.
2. Garrison, T. 2016. Oceanography: An Invitation to Marine Science, 9th ed, Cengage Learning.
3. Karanth, K.R., 1988. Ground Water: Exploration, Assessment and Development, Tata- McGraw Hill.
4. Raghunath, H.M. 2006. Hydrology: Principles, Analysis, Design, 3rd ed, New Age International Publishers.
5. Reddy, P.J.R. 2014. A Textbook of Hydrology, University of Science Press.

SEMESTER –V

COURSE TITLE: Field Report
COURSE CODE: BGEOMAJ07S
CREDIT: 6 (PRACTICAL)

MAJOR – 7: PRACTICAL	COURSE OBJECTIVE	COURSE OUTCOMES
Field Report 25 **Viva-voce 15** **Internal Assessment (Group Study) 10** **Guidelines on execution:** a. The work is to be based mainly on processing of primary data collected from field with the help of appropriate schedules for physical and socio-economic survey, stressing on any local problem or any contemporary issue. b. The following are to be taken as base maps, subject to availability: Cadastral map/ City Ward Boundary map. c. Interrelations between physical, social, economic, cultural aspects of the study should be the focus of the Field Report. d. Text of the Report should not exceed 3,000 words and should ideally be divided into the following sections: Introduction, Statement of problem(s) and Objectives, Materials and methods, Results & Discussions, Conclusion, References / Bibliography and Appendices (if any). e. Maps, diagrams and sketches, excluding photographs, should not exceed 30 pages of A4 size paper. f. Handwritten Report duly signed endorsed by the Faculty(s) and endorsed by the HOD is to be produced individually by the students. **Photocopying and computer typing are strictly restricted.**	**To introduce students to the principles of geography as a field science.** **To strengthen observation abilities of the students and educate them in field survey and data collection, data analysis utilizing various technologies, and advanced techniques.**	**Students will be able to visualise spatial data utilising a variety of cartographic and mapping approaches .** **Students will be trained to perform all levels of pre-field, field, and post-field activities.**

Selected References:

1. Chandan, S.D., Debajyoti, M. 2023. Geospatial Techniques and Research in Geography, Enova Publications.

2. Lemon, B. Paul, C. (). Fieldwork Techniques and Projects in Geography. Collins Pub.

3. Sengupta, P., Bandopadhya, M., Mitra, K., Sen, J. 2011. Project Work, Field Report and Geographical Study. Kalyani Publishers.

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END OF SEMESTER – V

SEMESTER –VI

COURSE TITLE: Philosophy of Geography
COURSE CODE: BGEOMAJ08T
CREDIT: 6 (THEORY)

MAJOR – 8: THEORY	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Evolution of Prehistoric Geographical Ideas [26 Hours] 1.1 Contribution of pioneers in the development of geographical ideas: Greeks and Romans. (6 lectures) 1.2 Dark Age- A period of turmoil in Europe and its impact on Geography. (6 lectures) 1.3 Contribution of Indian, Chinese, and Arab geographers in shaping the geographical knowledge. (8 lectures) 1.4 Age of exploration and discoveries. (6 lectures)	**To cater knowledge pertaining to the nature of the subject.** **To represent the systematic development of the subject from prehistoric to modern times.** **To promote an understanding related to the vastness and dynamicity of the discipline as a science of synthesis.**	**Students will have an in-depth knowledge of the development of the subject and its different philosophical outlooks.** **Students will get new knowledge in emerging areas for discourse and development in geographical studies.**
Unit II: Evolution of Modern Geographical Ideas [28 Hours] 2.1 Bernhard Varenius and Immanuel Kant: Cosmography to scientific geography. Founders of modern geographical thoughts- Alexander von Humboldt and Carl Ritter. (6 lectures) 2.2 Schools of Geography- German, French, British, and American. (8 lectures 2.3 Dichotomies and dualism in geography, (8 lectures) 2.4 Quantitative revolution and paradigm shift in geography. (6 lectures)		
Unit III: Contemporary Discourses [24 Hours] 3.1 Positivism and Empiricism (6 lectures) 3.2 Marxism, Radicalism (6 lectures) 3.3 Behaviourilism, Humanistic Geography (6 lectures) 3.4 Postmodernism, Gender Geography (6 lectures)		

References:

1. Hussain, M. 2017. Evolution of Geographical Thought, Rawat Publications.
2. Adhikari, S. 2015. Fundamentals of Geographical Thought, Orient Blackswan Pvt. Ltd.
3. Dikshit, R.D. 2018. Geographical Thought - A Contextual History of Ideas. PHI Learning.
4. Hartshorne, R. 2002. The Nature of Geography, Rawat Publication.

SEMESTER –VI

COURSE TITLE: Geography of India
COURSE CODE: BGEOMAJ10T
CREDIT: 6 (THEORY)

MAJOR – 9: THEORY	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Geography of India [30 Hours] 1.1 Physical divisions of India: physiography, drainage, soil and vegetation. (8 lectures) 1.2 Indian Monsoon – theories on origin; characteristics and impact. (6 lectures) 1.3 Economy: Agriculture – major crops (Rice, Wheat) & role of Green Revolution; Industry - Cotton textile, Petrochemicals and Tourism. (8 lectures) 1.4 Population: growth, composition (age-sex, caste & tribe), migration and urbanization. (8 lectures)	**This course aims to understand the regional geography of India and West Bengal.** **To introduce to the economic and cultural aspects, and their impact on the development of the different regions**	**Students will be aware of the spatial dimensions of the different regions of the country and evaluate the plans and policies for sustainable regional development.** **Students will be able to select and apply appropriate indicators for the measurement of regions.**
Unit II: Regional Perspectives of India [24 Hours] 2.1 Concept and types of regions. Regionalization: Basis and techniques of delineation. (6 lectures) 2.2 Regional perspective: physical (Thar), ethnicity (North-East); planning (DVC) (6 lectures) 2.3 Regional problems and Regionalism. (6 lectures) 2.4 Regional disparity; Regional development: Five Year Plan; NITI Aayog (6 lectures)		
Unit II: Regional Perspectives of West Bengal [24 Hours] 3.1 Physical regions with special reference to Rarh and Barendrabhumi (6 lectures) 3.2 Socio-economic regions: Hooghly Industrial Region; Tea plantation area (6 lectures) 3.3 Regional perspective & problems: Sundarban & Manbhum (6 lectures) 3.4 Regional Development Authority: Gorkhaland Territorial Administration and Paschimanchal Unnyayan Parshad (6 lectures)		

References:

1. Galina, S., Sengupta, P. 1967. Economic Regionalisation of India, Census of India.
2. Khullar, D.R. 2014. India: A Comprehensive Geography, Kalyani Publishers, New Delhi.
3. Raza, M. (Ed) 1988. Regional Development: Contributions to Indian Geography. New Delhi,
4. Sharma, T.C. 2003. India - Economic and Commercial Geography, Vikas Publ., New Delhi.
5. Singh, J. 2003. India - A Comprehensive & Systematic Geography, Gyanodaya Prakashan.

SEMESTER –VI

COURSE TITLE: Geoinformatics
COURSE CODE: BGEOMAJ10S
CREDIT: 6 (PRACTICAL)

MAJOR – 10: PRACTICAL	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Aerial Photographs and Remote Sensing [78 Hours] 1.1 Concept of Aerial Photographs, Key elements, Photo scale, Height of flight, End lap and Side lap, Identification of Physico-cultural features from Aerial Photographs.(18 lectures) 1.2 Remote Sensing – definition, development, EMR & EMS, Spectral reflectance curves; Platforms, Orbits; Sensors, Types of Satellite Remote Sensing. IRS and Landsat missions. Digital data format and metadata; Image referencing schemes and data acquisition. (18 lectures) 1.3 Principles of Image Rectification & Enhancement; Image Registration; Subset Image. Preparation of Colour Composites (TCC, FCC & SFCC) & Indices (NDVI, NDWI, NDBI) from IRS LISS-3, Landsat TM and OLI data. (22 lectures) 1.4 Principles of visual & digital image interpretation. Preparation of inventories of land use land cover (LULC) features from satellite images. (20 lectures)	**To understand the basic concepts and principles of remote sensing and GIS.** **To study the basics of digital image processing to solve the real-world problems.**	**Students will acquire employable skills in remote sensing and GIS.** **Students will be able to apply algorithms that will help to analyze and evaluate digital images.** **Students will also be able to create thematic maps relevant for resource analysis and management.**
Unit II: GNSS & GIS [78 Hours] 2.1 Principles of GNSS positioning with special reference to GPS, Collection and retrieval of GNSS data. (18 lectures) 2.2 GIS – definitions, components, development and applications. (14 lectures) 2.3 Data Structures: Spatial & non-spatial; Spatial Data Models: Raster and Vector data models; Spatial data relationship – Topology. GIS Database Creation, DBMS and its use in GIS. (22 Lectures) 2.4 GIS-based Modelling and Spatial Overlay: Point, line & areal data; Application in Physical Geography and Human Geography, Web-GIS. (24 Lectures) **Project File** a) Mapping Physical and Cultural features from Aerial Photograph. b) Georeferencing of maps and images. Creation of Subset image. Image enhancement; preparation of reflectance libraries of LULC features across different bands. Image classification, post-classification analysis and class editing. Application of Remotely Sensed data . c) Topology Creation; Data attachment and Creation of DBMS, Thematic Mapping:		

Morphometric Analysis and Choropleth Mapping. d) Preparation of map from GNSS data.		

References:

1. Campbell, J.B. 2007. Introduction to Remote Sensing, Guildford Press.
2. Jensen, J.R. 2004. Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
3. Lillesand, T.M., Kiefer, R.W., Chipman, J.W. 2004. Remote Sensing and Image Interpretation, Wiley.
4. Bhatta, B. 2011. Remote Sensing and GIS, 2nd ed, Oxford Univ. Press.
5.Bolstad, P. 2016. GIS Fundamentals: A First Text on Geographic Information Systems, 5th ed, XanEdu Publishing.

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END OF SEMESTER – VI

SEMESTER –VII **COURSE TITLE:** **COURSE CODE:** **CREDIT: 6**		
	COURSE OBJECTIVE	**COURSE OUTCOMES**
MAJOR – 11: THEORY	NOT DECIDED YET	
MAJOR – 12: THEORY	NOT DECIDED YET	
MAJOR – 13: THEORY	NOT DECIDED YET	

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END OF SEMESTER – VII

SEMESTER –VIII **COURSE TITLE:** **COURSE CODE:** **CREDIT: 4**		
	COURSE OBJECTIVE	**COURSE OUTCOMES**
MAJOR – 14: THEORY	NOT DECIDED YET	
MAJOR – 15: THEORY	NOT DECIDED YET	
MAJOR – 16: THEORY	NOT DECIDED YET	

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END OF SEMESTER – VI

GEOGRAPHY (MINOR) UG SYLLABUS FOR NEP 2020

SEMESTER –II

COURSE TITLE: Climate Change
COURSE CODE: BGEOMEB12T
CREDIT: 4 (THEORY)

MINOR – 1: THEORY	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Climate and Climate Change: Basic Concepts [26 Hours] 1.1 Weather and Climate, Determinants of Climate, Factors Affecting Climate. (6 lectures) 1.2 Global Climate system, Variations of Atmospheric Composition, Temperature and Pressure. (8 lectures) 1.3 Scientific Evidence about Past Climates. (6 lectures) 1.4 Natural Climate Change in Earth's History. (6 lectures)	**To explain the basic concepts of climate. To assess and anticipate weather events and threats. To learn Climate Change management programs**	**Students will be able to comprehend the climate system. Students will acquire insight into the space-time scale fluctuation of Climate. Students will learn all aspects of adaptation and mitigation to Climate Change.**
Unit II: Climate Change: Adaptation and Mitigation [26 Hours] 2.1 Importance of Climate Change Adaptation, Vulnerability Assessment-IPCC Framework (AR5 and AR6). (6 lectures) 2.2 Identifying and Selecting Adaptation Option, Linking Adaptation and Development Planning. (6lectures) 2.3 Climate Change Mitigation and Low Carbon Development, Policy Approaches for Mitigation and Low Carbon Development. (6 lectures) 2.4 Climate Change Finance: National and International Approach, Role of National and Sectoral Institutions in Climate Change Planning. (8 lectures)		

References:

1. Gore, A. 2009. Our Choice: A Plan to Solve the Climate Crisis, Rodale Books
2. Girardet, H. 2007. Surviving the Century: Facing Climate Chaos and Other Global Challenges, EarthScan.
3. Plimer, I. 2005. Heaven and Earth: Global Warming – The Missing Science, Connor Court Publishing.

SEMESTER –III

COURSE TITLE: Geography of India and West Bengal
COURSE CODE: BGEOME23T
CREDIT: 4 (THEORY)

MINOR – 1: THEORY	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Geography of India Concepts 1.1 Broad physiographic divisions and river systems. (6 lectures) 1.2 Climate, soil and vegetation. (8 lectures) 1.3 Population Characteristics, growth, composition and policies.(6 lectures) 1.4 Distribution of different types of renewable and non-renewable resources in India; Agricultural regions, Green revolution and Land-reforms. (6 lectures)	**To introduce students to interdisciplinary viewpoints on various geographic dimensions in India and West Bengal.** **To educate the students about**	**Students will be able to perceive the geographical context of India active as a distinct discipline of regional geography** **Students will be able to**

Unit II: Geography of West Bengal 2.1 Natural regions: physiography, climate, soil and water resources. (6 lectures) 2.2 Population density and growth; urbanization and migration. (6 lectures) 2.3 Rarh Bengal and Junglemahal: Physico-cultural aspects. (6 lectures) 2.4 Regional issues: Landslide of Hill Region and coastal hazards of Sundarban. (8 lectures)	**the importance of spatial perspectives in illustrating physical and socioeconomic-cultural scenario of India and West Bengal.**	**evaluate geomorphic and socio-economic changes, as well as its drivers and implications.**
References: 1. Deshpande, C.D. 1992. India: A Regional Interpretation, ICSSR, New Delhi. 2. Johnson, B.L.C. (Ed) 2001. Geographical Dictionary of India, Vision Books, New Delhi. 3. Mandal, R.B. (Ed) 1990. Patterns of Regional Geography: An International Perspective, Vol. 3, Concept Publishing Company.		

SEMESTER –V **COURSE TITLE: Rural Development** **COURSE CODE: BGEOME36T** **CREDIT: 4 (THEORY)**		
MINOR – 1: THEORY	**COURSE OBJECTIVE**	**COURSE OUTCOMES**
Unit I: Approaches to Rural Development 1.1 Rural Development: Concept, basic elements, measuring the level of rural development. (6 lectures) 1.2 Paradigms of rural development: Marxian approach and Gandhian approach to rural development. (8 lectures) 1.3 Rural Economic Base: Agriculture and Allied Sectors, Seasonality and Need for expanding Non-Farm Activities,Rural Co-operatives and agricultural marketing; Concept of PURA. (6 lectures) 1.4 Rural Governance: Panchayati Raj system – structure, functions & problems. Rural financial institutions: NABARD, SHGs – structure & functions. (6 lectures)	**To provide an overview of the concept and basic elements of rural development. To understand the process of rural development in India.** **To study the different programmes adopted by the government to promote development of rural areas in India.**	**Students will understand the concept and basic elements of rural development.** **Students will be able to analyze and evaluate the existing programmes of rural development.**
Unit II: Rural Development Programmes 2.1 Area Based Approach: DPAP, TADP. (6 lecture) 2.2 Target Group Approach: MNREGA, SGSY. (6 lecture) 2.3 Rural Infrastructural Development : Rural Electrification - DDUGJY, Housing – PMAYG, Transport & connectivity – PMGSY. (6 lecture) 2.4 Provision of Services – physical and socio-economic access to elementary education – SSA, Primary Health Care – NRHM. (8 lecture)		
References: 2. Krishnamurthy, J. 2000. Rural Development: Problems and Prospects, Rawat Publications. 3. Lee, D.A., Chaudhri, D.P. (Eds) 1983. Rural Development and State, Methuen Publishing. 4. Misra, R.P., Sundaram, K.V. (Eds) 1979. Rural Area Development: Perspectives and Approaches, Sterling Publishers.		

SYLLABUS FOR UG GEOGRAPHY (SKILL ENHANCEMENT (SEC) COURSES)
NEP 2020

SEMESTER –I / II / III

COURSE TITLE: Geoinformatics

COURSE CODE:

CREDIT: 3 (PRACTICAL)

SEC-I/ II / III	COURSE OBJECTIVE	COURSE OUTCOMES
Unit I: Remote Sensing [20 Hours] 1.1 Remote Sensing – definition, development, EMR & EMS, Spectral reflectance curves; Platforms, Orbits; Sensors, Types of Satellite Remote Sensing. IRS and Landsat missions. Digital data format and metadata; Image referencing schemes and data acquisition. (5 lectures) 1.2 Remote Sensing – definition, development, EMR & EMS, Spectral reflectance curves; Platforms, Orbits; Sensors, Types of Satellite Remote Sensing. IRS and Landsat missions. Digital data format and metadata; Image referencing schemes and data acquisition. (5 lectures) 1.3 Principles of visual & digital image interpretation. (5 lectures) 1.4 Preparation of inventories of land use land cover (LULC) features from satellite images. (5 lectures)	**To understand the basic concepts and principles of remote sensing and GIS.** **To study the basics of digital image processing to solve the real-world problems.** **To understand GIS data types and structures with geo-processing, visualization techniques in GIS**	**Students will acquire employable skills in remote sensing and GIS. Students will be able to apply algorithms that will help to analyze and evaluate digital images.** **Students will also be able to create thematic maps relevant for resource analysis, management.**
Unit II: GIS [19 Hours] 2.1 GIS – definitions, components, development and applications. (4 lectures) 2.2 Data Structures: Spatial & non-spatial; Spatial Data Models: Raster and Vector data models; (4 lectures) 2.3 Spatial data relationship – Topology.GIS Database Creation and Maintenance. (6 lectures) 2.4 GIS-based Modelling and Spatial Overlay: Point, line & areal data. (5 lectures) **Project File** a) Georeferencing of maps and images. Image enhancement; preparation of reflectance libraries of LULC features across different bands. Image classification, post-classification analysis and class editing. Application of Remotely Sensed data . b) Topology Creation; Data attachment and Creation of DBMS, Thematic Mapping: Morphometric Analysis and Choropleth Mapping.		

References:

1. Campbell, J.B. 2007. Introduction to Remote Sensing, Guildford Press.
2. Jensen, J.R. 2004. Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.