LESSON PLAN (MORNNING)

Department of Geography

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
1	GENERAL	CC 1/GE 1 THEORY	GEOTECTONICS	ALOKA MUKHOPADHYAY	16
			GEOMORPHOLOGY		21
			HYDROLOGY		10
			OCEANOGRAPHY		14
1	GENERAL	CC 1/ GE 1 PRACTICAL	PHYSICAL GEOGRAPHY LAB		60
2	GENERAL	CC-2/ GE2 THEORY	CLIMETOLOGY		25
			SOIL GEOGRAPHY		20
			BIOGEOGRAPHY		15
2	GENERAL	CC-2/ GE2 PRACTICAL	ENVIRONMENTAL GEOGRAPHY		60
	GENERAL	CC-3 THEORY	ECONOMIC GEOGRAPHY		20
			SOCIAL GEOGRAPHY		21
			CULTURAL GEOGRAPHY		20
3	GENERAL	CC 3 PRACTICAL	HUMAN GEOGRAPHY		60
3	GENERAL	CC 3 SEC A2	FOREST &WILDLIFE MANAGEMENT		30
4	GENERAL	CC 4 THEORY	SCALE &PROJECTION	ALOKA MUKHOPADHYAY	14
			TOPOGRAPHIC & THEMATIC MAPS		17
			REMOTE SENCING &GEOGRAPHICAL INFORMATION SYSTEM		21
			SURVEYING		12
4	GENERAL	CC 4 PRACTICAL	CARTOGRAPHY		60
	GENERAL	CC-4 SEC B2	SUSTAINABLE DEVELOPMENT		30

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
5	GENERAL	DSE A1 THEORY	REGIONAL DEVELOPMENT	ALOKA MUKHOPADHYAY	57
5	GENERAL	DSE A1 PRACTICAL	REGIONAL DEVELOPMENT LAB		60
5	GENERAL	SEC A2 THEORY	FOREST &WILDLIFE MANAGEMENT		30
6	GENERAL	DSE B THEORY	POPULATION GEOGRAPHY		60
6	GENERAL	DSE B PRACTICAL	POPULATION GEOGRAPHY		60
	GENERAL	DSE SEC B2	SUSTAINABLE DEVELOPMENT		30

Lesson Plan
Department of Geography(Day Section)

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
First	Hons	CC – 1 Geotectonics and Geomorphology (Theory)	Earth's tectonic and structural evolution with reference to geological time scale.	PG	3
			Earth's interior with special reference to seismology. Isostasy: Models of Airy, Pratt, and their applicability.	PG	3
			Plate Tectonics as a unified theory of global tectonics: process and landfroms at plate margins and hotspots.	PG	10
			Folds and Faults- origin and types.	PG	4
			Degradational processes: Weathering and resultant landforms.	SN	2.5
			Degradational processes: mass wasting, and resultant landforms.	KB	2.5
			Processes of entrainment, transportation, and deposition by different geomorphic agents. Role of humans in landfrom development.	KB	4
			Development of river network and landforms on uniclinal and folded structures. Surface expression of faults.	KB	7
			Development of river network and landforms on granites,basalts and limestones.	KB	4
			Coastal processes and landfroms.	SN	4
			Glacial and glacio-fluvial processes and landfroms.	KB	4
			Aeolian and fluvio-aeolian processes and landfroms.	KB	4
			Role of time in geomorphology: Schumn	PD	8

			and Lichty's model. Models on landscape evolution: Views of Davis, Penk,and Hack. Significance of systems approach.		
		CC - 1 Geotectonics and Geomorphology Lab (Practical)	Measurement of dip and strike using clinometer.	KB	6
			Megascopic identification of (a) mineral samples:Bauxite, calcite, chalcopyrite, feldspar,galena,gypsum, hematite, magnetite,mica, quartz, talc,tourmaline; and (b) rock samples: Granite,basalt, dolerite, laterite,limestone,shale, sandstone, conglomerate, slate,phyllite,schist,gneiss, quartzite,marble.	PG	14
			Extraction and interpretation of geomorphic information 1:50K topographical maps of plateau region: Delineation of drainage basins. Construction of relative relief map, drainage density map (c.5'*5').	PD	15
			Construction of relief profiles (superimposed, projected, composite).	PG	5
			Construction of slope map (Wentworth's method), stream ordering (Strahler), and bifurcation ratio on a drainage basin (c.5'*5').	SN	15
			Construction of hypsometric curve and derivation of hypsometric integer of a drainage basin (c.5'*5')from survey of India 1:50K Topographical maps of plateau region.	KB	5

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Second	Hons	CC – 3 Human Geography (Theory)	Nature, scope and recent trends. Elements of human geography.	PG	4
			Approaches to Human Geography: resource, locational , landscape, environment.	PG	6
			Concept and classification of race. Ethnicity.	PD	5
			Space, society and cultural regions (language and religion).	PD	5
			Evolution of human societies: Hunting and food gathering, pastoral nomadism , subsistence farming and industrial society.	KB	6
			Human adaptation to environment: Case studies of Eskimos, Masai and Maori.	KB	4
			Population growth and distribution, composition , demographic transition.	PD	5
			Populaion-resource regions(Akerman).	PD	5
			Development-environment conflict.	PG	5
			Types and patterns of rural settlements.	SN	5
			Rural house types in India.	SN	5
			Morphology and hierarchy of urban settlements.	PG	5
		CC - 3 Human Geography Lab (Practical)	Spatial variations in continent or country level religious compositions by divided proportional circles.	PG	12

			Measuring arithmetic growth rate of population comparing two decadal datasets.	PG	15
			Types of Age-Sex pyramids (progressive, regressive, intermediate and stationary): Graphical representation and analysis.	PD	20
			Nearest neighbor analysis from survey of India 1:50k topographical maps(5'x5').	PG	13

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Third	Hons	CC – 5 Climatology (Theory)	Nature, Composition and layering of the atmosphere.	PG	4
			Insolation: Controlling factors. Heat budget of the atmosphere.	PG	6
			Temperature: Horizontal and vertical distribution. Inversion of temperature: types, causes and consequences.	PG	6
			Overview of climate change: Greenhouse effect. Formation, depletion and significance of the ozone layer.	PG	4
			Condensation: Process and forms. Mechanism of precipitation: Bergeron-Findeisen theory, collision and coalescence. Forms of precipitation.	PG	6
			Air mass: Typology, origin, characteristics and modification.	PG	4
			Fronts: Warm and cold, frontogenesis and frontolysis.	PG	5
			Weather: Stability and instability, barotropic and	PG	5

			baroclinic conditions.		
			Circulation in the atmosphere: Planetary winds, jet streams, index cycle.	PG	5
			Atmospheric disturbances: Tropical and mid-latitude cyclones, thunderstorms.	PG	5
			Monsoon circulation and mechanism with reference to India.	PG	5
			Climatic classification after Thornthwaite (1955) and Oliver.	PD	5
		CC - 5 Climatology Lab (Practical)	Measurement of weather elements using analogue instruments: Mean daily temperature, air pressure, relative humidity, rainfall.	PG	15
			Interpretation of a daily weather map of India (any two): Pre-Monsoon, Monsoon and Post-Monsoon.	PG	20
			Construction and interpretation of hythergraph and climograph (G. Taylor).	PG	15
			Construction and interpretation of wind rose.	PG	10
		CC – 6 Hydrology and Oceanography (Theory)	Systems approach in hydrology. Global hydrological cycle: Its physical and biological role.	SN	5
			Run off: Controlling factors. Infiltration and evapotranspiration. Run off cycle.	KB	5
			Drainage basin as a hydrological unit. Principles of water harvesting and watershed management.	KB	5
			Groundwater : Occurrence and storage. Factors controlling recharge, discharge and movement.	SN	5
			Major relief features of the ocean floor: Characteristics and origin according to plate tectonics.	PD	6
			Physical and chemical	PD	4

			properties of ocean water.		
			Water mass, T-S diagram	KB	4
			Air-Sea interactions, ocean circulation, wave and tide.	KB	8
			Ocean temperature and salinity: Distribution and determinants.	PD	4
			Coral reefs: Formation, classification and threats.	KB	5
			Marine resources: Classification and sustainable utilisation.	PD	4
			Sea level change: Types and causes.	KB	5
		CC – 6 Hydrology and Oceanography Lab (Practical)	Construction and interpretation of rating curves.	PD	10
			Construction and interpretation of hydrographs and unit hydrographs.	PD	15
			Monthly rainfall dispersion diagram (Quartile method), Climatic water budget and Ergograph.	KB	25
			Construction of Theissen polygon from precipitation data.	KB	10
		CC – 7 Statistical Methods in Geography (Theory)	Importance and significance of statistics in Geography.	SN	4
			Discrete and continuous data, population and samples, scales of measurement (nominal, ordinal, interval and ratio).	SN	5
			Sources of geographical data for statistical analysis.	SN	4
			Collection of data and formation of statistical tables.	SN	5
			Sampling: Need, types and significance and methods of random sampling.	SN	4
			Theoretical distribution: frequency, cumulative frequency, normal and probability.	SN	6
			Central tendency: Mean, median, mode, partition values.	SN	6
			Measures of dispersion range, mean deviation, standard deviation, coefficient of	SN	6

			variation.		
			Association and correlation: Rank correlation, product moment correlation.	PD	5
			Regression: Linear and non-linear.	PD	5
			Time series analysis: Moving average.	SN	5
			Hypothesis testing: Chi-squared and T-test.	PD	5
		CC – 7 Statistical Methods in Geography Lab (Practical)	Construction of data matrix with each row representing an areal unit (districts/ blocks/ mouzas/ towns) and corresponding columns of relevant attributes.	SN	15
			Based on the above, a frequency table, measures of central tendency and dispersion would be computed and interpreted using histogram and frequency curve.	SN	15
			From the data matrix, a sample set (20%) would be drawn using random, systematic and stratified methods of sampling and the samples would be located on a map with an explanation of the methods used.	SN	15
			Based on of the sample set and using two relevant attributes, a scatter diagram and linear regression line would be plotted and residual from regression would be mapped with a short interpretation.	PD	15
		SEC - A-2 Tourism Management (Theory)	Scope and Nature: Concepts and issues, tourism, recreation and leisure inter-relations; Factors influencing tourism, Types of tourism: Ecotourism, cultural tourism, adventure tourism, medical tourism, pilgrimage, international, national.	PD	10

			Use of information on factors (Historical, natural, socio-cultural and economic; motivating factors for pilgrimages) to plan destination marketing; tourism products; niche tourism planning.	SN	5
			Tourism impact assessment, Sustainable tourism, Information Technology and Tourism, Tour operations planning and guiding.	PG	8
			Increasing Global tourism ; Tourism in India: Tourism infrastructure, access, planning for different budgets for case study sites of Western Himalayas, Goa, Chilka/Vembanad, Jaipur.	KB	7

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Fourth	Hons	CC - 8 Economic Geography (Theory)	Meaning and approaches to economic geography	PD	4
			Concepts in economic geography: Goods and services, production, exchange, and consumption.	PD	6
			Concept of economic man. Theories of choices.	PD	6
			Economic distance and transport costs.	PD	4
			Concept and classification of economic activities.	PD	4
			Factors affecting location of economic activity with special reference to agriculture (von Thünen), and industry (Weber).	SN	6
			Primary activities: Agriculture, forestry, fishing, and mining.	KB	6
			Secondary activities: Classification of manufacturing, concept of manufacturing regions, special economic zones and technology parks.	PD	6
			Tertiary activities: Transport, trade and services.	PD	6

			Transnational sea-routes, railways and highways with reference to India.	PD	4
			International trade and economic blocs.	PD	4
			WTO and BRICS: Evolution, structure and functions.	PD	4
		CC - 8 Economic Geography Lab (Practical)	Choropleth mapping of state-wise variation in GDP.	PD	10
			State-wise variation in occupational structure by proportional divided circles.	PD	15
			Time series analysis of industrial production (India and West Bengal).	KB	20
			Transport network analysis by detour index and shortest path analysis.	PD	15
		CC - 9 Regional Planning and Development (Theory)	Regions: Concept, types, and delineation.	PG	4
			Regional Planning: Types, principles, objectives, tools and techniques.	PG	6
			Regional planning and multi-level planning in India.	PG	6
			Concept of metropolitan area and urban agglomeration.	PG	4
			Concept of growth and development, growth versus development.	PG	4
			Indicators of development: Economic, demographic, and environmental.	PG	6
			Human development: Concept and measurement.	SN	4
			Theories and models for regional development: Cumulative causation (Myrdal).	KB	4
			Models and theories in regional development: Stages of development (Rostow), growth pole model (Perroux).	PG	6
			Underdevelopment: Concept and causes .	SN	4
			Regional development in India: Disparity and diversity.	PG	5
			Need and measures for balanced development in India.	PG	5

		CC - 9 Regional Planning and Development Lab (Practical)	Delineation of formal regions by weighted index method.	PG	15
			Delineation of functional regions by breaking point analysis .	PD	15
			Measurement of inequality by location quotient.	PG	15
			Measuring regional disparity by Sopher index.	PG	15
		CC - 10 Soil and Biogeography (Theory)	Factors of soil formation.	KB	3
			Definition and significance of soil properties: Texture, structure, and moisture.	KB	5
			Definition and significance of soil properties: pH, organic matter, and NPK.	KB	5
			Soil profile. Origin and profile characteristics of lateritic, podsol and chernozem soils.	KB	6
			Soil erosion and degradation: Factors, processes and management measures. Humans as active agents of soil transformation.	KB	5
			Principles of soil classification: Genetic and USDA. Concept of land capability and its classification.	KB	6
			Concepts of biosphere, ecosystem, biome, ecotone, community and ecology.	SN	5
			Concepts of trophic structure, food chain and food web. Energy flow in ecosystems.	SN	5
			Classification of world biomes (Whittaker). Geographical extent and characteristics of tropical rain forest, savanna, hot desert, taiga and coral reef biomes.	SN	8
			Bio-geochemical cycles with special reference to carbon dioxide and nitrogen.	SN	4
			Deforestation: Causes, consequences and management.	SN	4
			Biodiversity: Definition, types, threats and conservation measures.	SN	4
		CC - 10 Soil and	Determination of soil reaction (pH) and salinity using field kit.	KB	15

		Biogeography Lab (Practical)	Determination of soil type by ternary diagram textural plotting .	KB	15
			Plant species diversity determination by matrix method.	SN	10
			Time series analysis of biogeography data.	SN	20
		SEC-B-3 Rural Development (Theory)	Rural Development: Concept, basic elements, measures of level of rural development.	PD	5
			Paradigms of rural development: Gandhian approach to rural development Lewis model of economic development, 'big push' theory of development, Myrdal's model of 'spread and backwash effects'.	SN	10
			Area based approach to rural development: Drought prone area programmes, PMGSY, SJSY, MNREGA, Jan Dhan Yojana.	KB	10
			Rural Governance: Panchayati Raj System and rural development policies and Programmes in India.	PG	5

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Fifth	Hons	CC – 11 Research Methodology and Fieldwork (Theory)	Research in Geography: Meaning, types and significance	PG	5
			Literature review and formulation of research design	PG	5
			Defining research problem, objectives and hypothesis	PG	6
			Research materials and methods	PG	4
			Techniques of writing scientific reports: Preparing notes, references, bibliography, abstract, and keywords	PG	6
			Plagiarism: Classification and prevention	PG	4
			Fieldwork in Geographical studies: Role and significance. Selection of study area and objectives. Pre-field academic preparations. Ethics of	SN	6

			fieldwork		
			Field techniques and tools: Observation (participant, non-participant), questionnaires (open, closed, structured, non-structured). Interview	SN	5
			Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording	SN	5
			Positioning and collection of samples. Preparation of inventory from field data	SN	4
			Post - field tabulation, processing and analysis of quantitative and qualitative data	SN	5
			Fieldwork: Logistics and handling of emergencies	SN	5
		CC –11 Research Methodology and Fieldwork Lab (Practical)	Each student will prepare a report based on primary data collected from field survey and secondary data collected from different sources. Students will select either one rural area (mouza) or an urban area (municipal ward) for the study, with the primary objective of evaluating the relation between physical and cultural landscape. A specific problem or a special feature should be identified based on which, the study area will be selected. The field work and post-field work will include: a. Collection of primary data on physical aspects (relief and soil) of the study area. Students should use survey instruments like prismatic compass, dumpy level, Abney level or clinometer wherever necessary.	KB	60

			b. Collection of soil samples from different land cover land use regions of the study area for determining pH and NPK values with help of a soil kit. c. Collection of socio economic data, at the household level (with the help of a questionnaire) in the selected study area. d. Plot to plot land use survey for preparation of a land use map, covering whole or part of the selected area. e. Visit to different organisations and departments for collection of secondary data. f. Any other survey relevant to the objective of the study. The Field Report should contain the following sections (a–e). a. Introduction: Study area extent and space relations, reasons for selection of the study area on the basis of a specific problem or special feature, objectives, methods of data collection, analyses and presentation, sources of information, etc. b. Physical aspects: Lithology and geological structure, relief, slope, drainage, climate, soil, vegetation, environmental issues, proneness to natural hazards, etc. c. Socio-economic aspects: i. Population attributes: Number, sex ratio, literacy, occupational structure, ethnic and religious composition, language, per capita income, etc. ii. Settlement characteristics: Number of houses, building materials, number and size of rooms, amenities, etc.		

			iii. Agriculture: General land use, crop-combination, use of fertiliser and irrigational facilities, production and marketing etc. iv. Other economic activities: Fishing, horticulture, brick-making, household and other industries, etc. d. Conclusions: Relation between physical and cultural landscape. Evaluation of problems and prospects. General recommendations. e. Bibliography. The students will prepare (i) a chorochromatic land use land cover map on the basis of plot to plot survey; (ii) a profile of suitable length, surveyed and plotted, with different land use land cover superimposed on it. All sections of the report should contain relevant maps, diagrams and photographs using primary and secondary data, clearly citing sources.		
		CC –12 Remote Sensing, GIS and GNSS (Theory)	Principles of Remote Sensing (RS): Types of RS satellites and sensors	PD	5
			Sensor resolutions and their applications with reference to IRS and Landsat missions	PD	5
			Image referencing schemes and acquisition procedure of free geospatial data from NRSC / Bhuvan and USGS	PD	5

			Preparation of False Colour Composites from IRS LISS-3 and Landsat TM / OLI data.	PD	5
			Principles of image interpretation. Preparation of inventories of landuse land cover (LULC) features from satellite images	PD	5
			Acquisition and utilisation of free Digital Elevation Model data: CartoDEM, SRTM and ALOS	PD	5
			GIS data structures types: Spatial and non-spatial, raster and vector	KB	5
			Principles of preparing attribute tables, data manipulation, and overlay analysis	KB	5
			Principles and significance of buffer preparation	KB	4
			Principles and significance of overlay analysis	KB	5
			Principles of GNSS positioning and waypoint collection	PD	5

			Principles of transferring of GNSS waypoints to GIS. Area and length calculations from GNSS data	PD	5
		CC –12 Remote Sensing, GIS and GNSS Lab (Practical)	Image georeferencing and enhancement. Preparation of reflectance libraries of LULC features across different image bands of IRS L3 or Landsat OLI data	PD	15
			Supervised image classification, class editing, and post-classification analysis	PD	15
			Digitisation of features and administrative boundaries. Data attachment, overlay, and preparation of annotated thematic maps	PD	20
			Waypoint collection from GNSS receivers and exporting to GIS database .	PD	10
		DSE-A2 Climate Change: Vulnerability and Adaptations (Theory)	The science of climate change: Origin, scope and trends .	PG	5
			Climate change with reference to the geological time scale.	PG	6
			Evidences and factors of climate change: The nature–man dichotomy.	PG	4
			Greenhouse gases and global warming.	PD	5

			Electromagnetic spectrum, atmospheric window, heat balance of the earth.	KB	5
			Global climatic assessment: IPCC reports.	SN	5
			Climate change and vulnerability: Physical; economic and social.	PG	5
			Impact of climate change: Agriculture and water; flora and fauna; human health and morbidity.	PD	5
			Global initiatives to climate change mitigation: Kyoto Protocol, carbon trading, clean development mechanism, COP, climate fund.	SN	5
			Climate change vulnerability assessment and adaptive strategies with particular reference to South Asia	KB	5
			National Action Plan on climate change.	KB	5
			Role of urban local bodies, panchayats, and educational institutions on climate change mitigation: Awareness and action programmes.	KB	5

		DSE-A2 Climate Change: Vulnerability and Adaptations Lab (Practical)	Analysis of trends of temperatures (maximum and minimum of about three decades) of any India Meteorological Department (IMD) station.	SN	10
			Comparative analysis of seasonal variability of rainfall on the basis of monthly data of any two IMD stations.	SN	15
			Annual rainfall variability of about three decades for any two representative climatic regions of India.	SN	15
			Preparation of an inventory of extreme climatic events and mitigation measure of any climatic region / country of South Asia for a period of one decade on the basis of secondary information.	PG	20
		DSE-B5 Cultural and Settlement Geography (Theory)	Definition, scope and content of cultural geography	KB	5
			Development of cultural geography in relation to allied disciplines	KB	5
			Cultural hearth and realm, cultural diffusion, diffusion of major world religions and languages	PD	6
			Cultural segregation and cultural diversity, culture, technology and development.	PD	5
			Races and racial groups of the world	PD	5

			Cultural regions of India	PD	4
			Rural settlement: Definition, nature and characteristics	SN	3
			Morphology of rural settlement: Site, situation, layout-internal and external	SN	5
			Rural house types with reference to India, social segregation in rural areas. Census of India categories of rural settlements	SN	7
			Urban settlement: Census of India definition and categories	PG	3
			Urban morphology: Models of Burgess, Hoyt, Harris, and Ullman.	PG	7
			City-region and conurbation. Functional classification of cities: Schemes of Harris, Nelson, and McKenzie	PG	5
		DSE-B5 Cultural and Settlement Geography Lab (Practical)	Mapping language distribution of India	PG	10
			CD block-wise housing distribution in any district of West Bengal using proportional square	PG	20
			Identification of rural settlement types from Survey of India 1:50k topographical maps	SN	15
			Social area analysis of a city (Shevky & Bell)	PG	15

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Sixth	Hons	CC – 13 Evolution of the Geographical Thought (Theory)	Development of pre-modern Geography: Contributions of Greek, Chinese, and Indian geographers	PG	5
			Impact of 'Dark Age' in Geography and Arab contributions	PG	5
			Geography during the age of 'Discovery' and 'Exploration' (contributions of Portuguese voyages, Columbus, Vasco da Gama, Magellan, Thomas Cook	PG	5
			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. Nomothetic)	PG	7
			Evolution of Geographical thoughts in	PG	5

			Germany, France, Britain, and United States of America		
			Contributions of Humboldt and Ritter	PG	3
			Contributions of Richthofen, Hartshorne–Schaeffer, Ratzel, La Blaché	PG	6
			Trends of geography in the post World War-II period: Quantitative revolution, systems approach	PG	7
			Structuralism and historical materialism	PG	3
			Changing concept of space with special reference to Harvey	PG	5
			Evolution of Critical Geography: Behavioural, humanistic, and radical	PG	5
			Towards post modernism: Geography in the 21st Century	PG	5
		CC - 13 Evolution of the Geographical Thought Lab (Practical)	Changing perception of maps of the world (Ptolemy, Ibn Batuta, Mercator)	PG	20
			Mapping voyages; Columbus, Vasco da Gama, Magellan, Thomas Cook	PG	20
			Group Presentation of five to ten students on any selected school of geographical thought	PG	20

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Sixth	Hons	CC – 14 Hazard Management (Theory)	Classification of hazards and disasters. Hazard continuum	KB	4
			Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms	KB	6
			Responses to hazards: Preparedness, trauma, and aftermath. Resilience, capacity building	KB	5
			Hazards mapping: Data and geospatial techniques (for hazards enlisted in Unit II and GEO-A-CC-6-14-P)	KB	5
			Earthquake: Factors, vulnerability, consequences, and management	KB	5
			Landslide: Factors, vulnerability, consequences, and management	KB	5
			Land subsidence: Factors, vulnerability, consequences, and management	KB	5
			Tropical cyclone: Factors, vulnerability, consequences, and management	KB	5
			Flood: Factors, vulnerability, consequences, and management	KB	5
			Riverbank erosion: Factors, vulnerability, consequences, and management	KB	5

			Fire: Factors, vulnerability, consequences, and management	KB	5
			Biohazard: Classification, vulnerability, consequences, and management	KB	5
		CC – 14 Hazard Management Lab (Practical)	A Group Project Report is to be prepared and submitted based on any one case study among the following hazards from West Bengal, incorporating a preparedness plan, preferably in the vicinity of the candidates' institution / district: 1.Earthquake 2. Landslide 3. Land subsidence 4.Thunderstorm 5. Flood 6. Riverbank / Coastal erosion 7. Fire 8. Industrial accident 9. Road / Railway accident 10. Structural collapse 11.Environmental pollution 12. Biohazard One case study will be done by a group of five to ten students.		
				KB	60

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Sixth	Hons	DSE-A-6-04 Resource Geography (Theory)	Natural resources: Concept and classification	SN	4
			Approaches to	SN	6

			resource utilization: Utilitarian, conservational, community based adaptive		
			Significance of resources: Backbone of economic growth and development	SN	5
			Pressure on resources. Appraisal and conservation of natural resources	SN	5
			Problems of resource depletion: global scenario (forest, water, fossil fuels)	SN	7
			Sustainable resource development	SN	3
			Distribution, utilisation, problems and management of metallic mineral resources: Iron ore, bauxite, copper	SN	6
			Distribution, utilisation, problems and management of non-metallic mineral resources: Limestone, mica, gypsum	SN	6
			Distribution, utilisation, problems and management of energy resources: Conventional and non-conventional	SN	6
			Contemporary energy crisis and future scenario	SN	4
			Politics of power resources	SN	3

			Limits to growth and sustainable use of resources. Concept of resource sharing	SN	5
		DSE-A-6-04 Resource Geography Lab (Practical)	Mapping and area estimate of changes in forest or vegetation cover from maps and/or satellite images	SN	15
			Mapping and number estimate of changes in water bodies from maps and/or satellite images	SN	15
			Decadal changes in state-wise production of coal and iron ore	SN	15
			Computing Human Development Index: Comparative decadal change of top five Indian states	SN	15

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Sixth	Hons	DSE-B-6-08 Geography Of India (Theory)	Physiographic divisions with reference to tectonic provinces	PD	5
			Climate, soil and vegetation: Classification and interrelation	PD	6
			Population: Distribution, growth, structure, and policy	PD	4
			Tribes of India with special reference to Gaddi, Toda, Santal, and Jarwa	PD	5

			Agricultural regions. Green revolution and its consequences	PD	4
			Mineral and power resources: Distribution and utilisation of iron ore, coal, petroleum, and natural gas	PD	6
			Industrial development: Automobile and information technology	PD	3
			Regionalisation of India: Physiographic (R.L. Singh) and economic (P. Sengupta)	PD	7
			Physical perspectives: Physiographic divisions, forest and water resources	PD	6
			Resources: Agriculture, mining,, and industry	PD	6
			Population: Growth, distribution, and human development	PD	4
			Regional issues: Darjeeling Hills and Sundarban	PD	4
		DSE-B-6-08 Geography of India Lab (Practical)	Monthly temperature and rainfall graphs of five select stations from different physiographic regions of India	PD	15
			Crop combination: Comparison of any two contrasting	PD	15

			districts from West Bengal		
			Annual trends of production: Mineral resources and manufacturing goods over two decades	PD	20
			Composite Index: Comparison of developed and backward states of India	PD	10

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
First	General	CC 1/GE 1 Physical Geography (Theory)	Earth's interior with special reference to seismology	PG	3
			Plate Tectonics as a unified theory of global tectonics. Formation of major relief features of the ocean floor and continents according to Plate Tectonics	PG	7
			Folds and faults: Classification and surface expressions	PG	6
			Degradational processes: Weathering, mass wasting, and resultant landforms	KB	4
			Principal geomorphic agents. Classification and evolution of fluvial, coastal, aeolian, and glacial landforms	KB	12
			Basic models of slope evolution: Decline, replacement, and retreat. Systems approach and its significance in geomorphology	PD	6
			Global hydrological cycle: Its physical and biological role	SN	2
			Run off: Controlling factors. Concept of ecological flow	SN	3
			Drainage basin as a hydrological unit. Principles of watershed management	KB	3
			Physical and chemical properties of ocean water.	PD	4

			Distribution and determinants of temperature and salinity		
			Overview of air-sea interactions. Ocean circulation, wave, and tide	SN	7
			Marine resources: Classification and sustainable utilisation	PD	3
		CC 1/GE 1 Physical Geography Lab (Practical)	Megascopic identification of mineral samples: Bauxite, calcite, chalcopyrite, feldspar, galena, hematite, mica, quartz, talc, tourmaline	PG	8
			Megascopic identification of rock samples: Granite, basalt, laterite, limestone, shale, sandstone, conglomerate, slate, phyllite, schist, gneiss, quartzite	PG	12
			Extraction of physiographic information from Survey of India 1:50k topographical maps of plateau region: Construction and interpretation of relief profiles (superimposed, projected and composite), Construction and interpretation of relative relief map (c. 5'×5')	SS	20
			Extraction of drainage information from Survey of India topographical maps of plateau region:	SS	20

			Extraction and interpretation of channel features and drainage patterns, Construction of channel profiles		

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Second	General	CC 2/GE 2 Environmental Geography (Theory)	Insolation and Heat Budget. Horizontal and vertical distribution of atmospheric temperature and pressure	PG	5
			Overview of planetary wind systems. Indian Monsoons: Mechanisms and controls	PG	6
			Atmospheric disturbances: Tropical and temperate cyclones. Thunderstorms	PD	7
			Overview of global climatic change: Greenhouse effect. Ozone depletion	PG	5
			Scheme of world climatic classification by Köppen	PD	2
			Factors of soil formation	KB	4
			Soil profile development under different climatic conditions: Laterite, Podsol, and Chernozem	KB	6
			Physical and chemical properties of soils: Texture, structure, pH,	KB	6

			salinity, and NPK status		
			USDA classification of soils. Soil erosion and its management	PD	4
			Ecosystem and Biomes. Distribution and characteristics of tropical rainforest; Savannah, and hot desert biomes	SN	6
			Plant types, occurrence and ecological adaptations: Halophytes, xerophytes, hydrophytes, and mesophytes	SN	5
			Biodiversity: Types, threats and management with special reference to India	SN	4
		CC 2/GE 2 Environmental Geography Lab (Practical)	Interpretation of daily weather map of India (any one): Pre-Monsoon or Monsoon or Post-Monsoon	SS	20
			Construction and interpretation of hythergraph, climograph (G. Taylor) and wind rose (seasonal)	SS	20
			Determination of soil type by ternary diagram textural plotting	SS	10
			Preparation of peoples' biodiversity register	PD	10

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Third	General	CC 3/GE 3	Sectors of the	PG	5

		Human Geography (Theory)	economy: Primary, Secondary, Tertiary and Quaternary. Factors affecting location of economic activities		
			Location of economic activities: Theories of von Thünen, Lösch, and Weber	PG	5
			Location of industries with special reference to India: Cotton, Iron and Steel	SN	5
			Globalisation and integration of world economies	PD	5
			Human Society: Structure, functions, social systems. Population and migration: overview, causes and effects	SN	5
			Types and characteristics of social organisations: Primitive, hunting–gathering, agrarian, industrial	SN	5
			Race, Language and Religion: Origin, characteristics and spatial variations	KB	6
			Social Issues: Diversity, conflict and transformation	KB	5
			Carl Sauer: cultural landscape and its elements	PG	6
			Rural and urban settlements: Differentiation in cultural landscapes	KB	5
			Cultural regions and cultural realms	PD	5
			Diffusion of culture and innovations	PD	4
		CC 3/GE 3 Human Geography	State-wise variation in occupational structure by proportional divided	SS	15

		Lab (Practical)	circles		
			Time series analysis of industrial production using any two manufactured goods from India	SS	20
			Measuring arithmetic growth rate of population comparing two datasets	SS	15
			Nearest neighbour analysis: Rural example from Survey of India 1:50k topographical maps	SS	10
		SEC A 2 Forest & Wildlife Management (Theory)	Forest and wildlife management: Importance and strategies. Role and significance of stakeholders. Tangible and intangible benefits of forest and wildlife management	PG	7
			Legal framework of forest and wildlife protection in India: The Indian Forest Act 1927, Forest Conservation Act 1980, Wild Life Protection Act 1972, Biodiversity Act 2002	SN	5
			Forests as common property resources. Forest rights: Tribals and forests. Gender dimension of forest management. Management of poaching and illegal logging.	PD	8
			Principles of community participation and joint forest management. Causes and management of human–wildlife conflicts with special reference to Jangal	KB	10

			Mahal, Sundarban and Duars [		

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Fourth	General	CC 4/GE 4 Cartography (Theory)	Maps: Classification and types. Scales: Types, significance, and applications	PD	3
			Coordinate systems: Polar and rectangular. Bearing: Magnetic and true, whole-circle and reduced	SN	3
			Map projections: Classification, properties and uses. Concept and significance of UTM projection	KB	8
			Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps	PG	4
			Representation of data by dots and proportional circles	PG	4
			Representation of data by isopleth and choropleth	SN	4
			Principal national agencies producing thematic maps in India: GSI, NATMO, NBSSLUP, NHO, and NRSC. Acquaintance with Bhuvan platform	PD	5
			Basics of Remote Sensing: Types of satellites, sensors, bands, and resolutions with special reference to 1the ISRO missions	PD	10
			Principles of preparing standard FCCs and classified raster images	KB	5
			Principles of Geographical Information	KB	6

			System: Concepts of vector types, attribute tables, buffers, and overlay analysis		
			Basic concepts of surveying and survey equipment: Prismatic compass	SN	6
			Basic concepts of surveying and survey equipment: Dumpy level	KB	6
		CC 4/GE 4 Cartography Lab (Practical)	Graphical construction of scales: Plain and comparative	SS	10
			Construction of projections: Simple Conic with one standard parallel, Cylindrical Equal Area,, and Polar Zenithal Stereographic	SS	20
			Construction of thematic maps: Proportional squares, proportional circles, choropleths, and isopleths	SS	20
			Preparation of annotated thematic overlays from satellite standard FCCs of 1:50k	SS	10
		SEC B4 Sustainable Development (Theory)	Sustainable development: Concept, Historical background, components, limitations	PG	5
			Global goals for sustainable development: Domain, conflict, crisis and compromise	KB	7
			Challenges of sustainable development: Determinants, linkage among sustainable development, environment and poverty	PD	10
			Global environmental issues: Population, income and urbanization, health care, forest and water resources	SN	8

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Fifth	General	DSE A1 Regional Development (Theory)	Definition of region. Types and need of regional planning	PG	3
			Choice of a region for planning; characteristics of an ideal planning region; delineation of planning region	PG	7
			Regionalization of India for planning (agro-ecological zones)	PG	5
			Strategies/models for regional planning: growth pole model of Perroux	PD	6
			Growth centre model in Indian context. Concept of village cluster	PD	4
			Problem regions and regional planning. Backward regions and regional plans: special area development plans in India. Damodar Valley Corporation: Success and failure	PD	5
			Changing concept of development and underdevelopment; Efficiency-equity debate	SN	5
			Indicators of development: Economic, demographic, and environmental. Concept of human development	SN	5
			Regional development in India, regional inequality, disparity and diversity	SN	5
			Development and regional disparities in India since Independence: Disparities in agricultural development	KB	5
			Development and	KB	5

			regional disparities in India since Independence: Disparities in industrial development		
			Development and regional disparities in India since independence : Disparities in human resource development in terms of education and health	KB	5
		DSE A1 Regional Development Lab(Practical)	Delineation of regions according to given criteria using Weaver's method	SS	15
			Determination of sphere of influence by gravity model	SS	15
			Measurement of inequality by Lorenz curve and location quotient	SS	15
			Preparation of Z-score and composite index from suitable data	SS	15
		SEC A2 Forest & Wildlife Management (Theory)	Forest and wildlife management: Importance and strategies. Role and significance of stakeholders. Tangible and intangible benefits of forest and wildlife management	PG	7
			Legal framework of forest and wildlife protection in India: The Indian Forest Act 1927, Forest Conservation Act 1980, Wild Life Protection Act 1972, Biodiversity Act 2002	SN	5
			Forests as common property resources. Forest rights: Tribals and forests. Gender dimension of forest management. Management of	PD	8

			poaching and illegal logging.		
			Principles of community participation and joint forest management. Causes and management of human–wildlife conflicts with special reference to Jangal Mahal, Sundarban and Duars	KB	10

Semester	Programme	Course and Name of the Paper	Topic	Teacher	No. Of hours
Sixth	General	DSE B 4 Population Geography (Theory)	Development of Population Geography as a field of specialization. Relation between population geography and demography. Sources of population data, their level of reliability and problems of mapping	PG	6
			Population distribution: Density and growth. Classical and modern theories on population growth, Demographic transition model	PG	6
			World patterns and determinants of population distribution and growth. Concept of optimum population	PG	4
			Population distribution, density, and growth in India	PD	4
			Types of population composition: Age–sex. rural–urban, literacy and education	KB	5
			Measurements of fertility and mortality. Concept of cohort and life table	PD	5
			Population composition	SN	7

			of India: Urbanisation and occupational structure		
			Migration: Causes and types	SN	3
			National and international patterns of migration with reference to India	SN	5
			Population and development: Population–resource regions (Ackerman). Concept of human Development Index and its components	PD	5
			Population policies in developed and less development countries. India's population policies. Population and environment, implication for the future	KB	5
			Contemporary issues: Ageing of population, declining sex ratio, population and environment dichotomy, impact of HIV/AIDS	KB	5
		DSE B 4 Population Geography Lab (Practical)	Population projection by arithmetic method	SS	15
			Population density mapping: State-wise for India	SS	15
			Analysis of work participation rate: Total and gender-wise for India	SS	15
			Analysis occupation structure by dominant and distinctive functions: Districts of West Bengal	SS	15
		SEC B4 Sustainable Development (Theory)	Sustainable development: Concept, Historical background, components, limitations	PG	5
			Challenges of sustainable development: Determinants, linkage	PD	10

			among sustainable development, environment and poverty		
			Global environmental issues: Population, income and urbanization, health care, forest and water resources	SN	8
			Global goals for sustainable development: Domain, conflict, crisis and compromise	KB	7