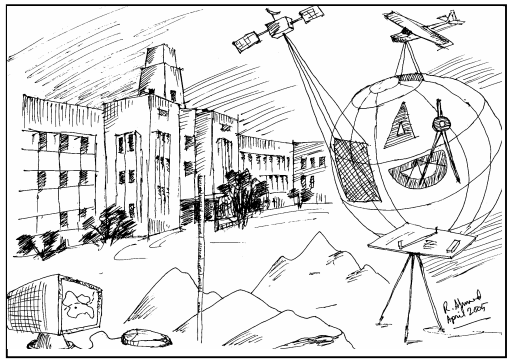
DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

Syllabus for Bachelor of Science (B.Sc.) Honours Session 2008-2009



University of Rajshahi
Rajshahi-6205
BANGLADESH
www.ru.ac.bd

Syllabus for Bachelor of Science (B.Sc.) Honours

Session 2008-2009

The B.Sc. Honours Course in Geography and Environmental Studies shall spread over 4 (four) academic years and the total marks in 4000 (40 units, 160 credits). Theory courses will comprise of four major and four minor courses. Major courses carry 100 marks each and will be of four credit hours. The minor courses carry 75 marks each and will be of three credit hours. Year wise distribution of marks & credits including practical and viva voce are shown below.

Year	Theory						English			Practical		
	Major			Minor			(Non Credit)					
	Unit	*Marks*	*Credit*	*Unit*	*Marks*	*Credit*	*Unit*	*Marks*	*Credit*	*Unit*	*Marks*	*Credit*
1st	4.0	400	16	4.0	300	12	0.5	50	N.C.	1.5	150	6
2nd	4.0	400	16	4.0	300	12	-	-	-	1.5	150	6
3rd	7.0	700	28	-	-	-	-	-	-	2.5	250	10
4th	7.0	700	28	-	-	-	-	-	-	2.5	250	10
Total	22.0	2200	88	6.0	600	24	-	-	-	8.0	800	32

Year	Viva voice			*Class Record			Total		
	Unit	*Marks*	*Credit*	*Unit*	*Marks*	*Credit*	*Unit*	*Marks*	*Credit*
1st	0.5	50	2	0.5	50	2	9.5	950	38
2nd	0.5	50	2	0.5	50	2	9.5	950	38
3rd	0.5	50	2	0.5	50	2	10.5	1050	42
4th	0.5	50	2	0.5	50	2	10.5	1050	42
Total	2.0	200	8	2.0	200	8	40	4000	160

*Details of Class Record

Attendance –	10
Tutorial/Terminal test-	15
Field Report-	25
Total	= 50

B.Sc. Honours Part-I Examination - 2009

Course No.	Title of the Course	Unit	Full Marks	Credit
Geo-101 Major:	Introduction to Geography and Environment.	1	100	4
Geo-102 Major:	Astronomical Elements in Geography	1	100	4
Geo-103 Major:	Introduction to Physical Environment.	1	100	4
Geo-104 Major:	History of Bangladesh	1	100	4
Geo-105 Minor:	Plant Geography	0.75	75	3
Geo-106 Minor:	Statistical Techniques in Geography	0.75	75	3
Geo-107 Minor:	Economic Elements in Geography	0.75	75	3
Geo-108 Minor:	Elements of Geology and Soil	0.75	75	3
N.C.109 (E):	English (Non Credit)	0.5	50	NC
Practicals:				
A:	Principles of Cartography			
B:	Analysis and Interpretation of Relief	1.5	150	6
C:	Field Work: Resource Survey of an Area (Not more than 2 days)			
	Viva-voce	0.5	50	2
	Class Records	0.5	50	2
	Total Credit	**9.5**	**950**	**38**

Course-101 Major: Introduction to Geography and Environment
Unit-1, Credit Hours: 4; Marks-100

1. The nature of geography as a dynamic academic discipline and applied science, development of methodological concepts with special reference to regional, spatial/locational, and ecological approaches, objectives and scope of modern geography.
2. Properties of geographical data, levels of measurement, problems and methods of data classification. Measures of spatial distributions and analysis of structure and processes, spatial pattern regularity, spatial system.
3. Tools in Geography: Maps and other simple models, problems of scale, size and shape in mapping, terrestrial space, absolute and relative location in spatial distribution; types of map and their use, remote sensing and field work in geography and environment.
4. The concepts and types of region.
5. Environment: meaning, structure, types and components of environment, geography and environment, environment and society.
6. Man-environment Relationships: Approaches to the study, environment and man, man's interaction with the environment; man and the environmental processes.
7. Relevance of geography to current problems of environment and ecology, issues of regional contrasts and inequalities in human development.

Course-102 Major: Astronomical Elements in Geography
Unit: 1, Credit Hours: 4; Marks: 100

1. Scheme of Knowledge: Astronomy - Concept, definition and branches. Relationship between astronomy and geography. Measurement: the band of geographical inquiry, G-scale.

2. Universe: Big Bang-Creation of primary elements, formation of galaxy; Stars- Polaris, Pole Star and Cassiopeia.
3. Solar System: Planets and Satellites, Sun, Earth and Moon. Form and Shape of the earth. Curvature of the earth-oblate, spheroid. Common centre of gravity. Polar axis and equatorial axis.
4. North: Geographic, magnetic and grid. Obliquity of the earth's orbit, eccentricity of the earth. Earth's orbit, inclination of the earth's orbit.
5. Earth's circumference and area. Longitude and Latitude - determination. Prime meridian. Length of latitudes and longitudes. Great circle. Rhumb line.
6. Rotation and revolution: Illumination of the globe. Circle of illumination. Finding of day and night and times of sun rise and sun set. Almanac and analema. Length of day and night - altitude of the sun. Solstices and equinoxes. Twilight - types, determination.
7. Time - longitude and time. Local and standard time, division of the earth according to standard time. Standard time of USA, India and Bangladesh. International date line, Month-different types. Calendar-astronomical, Jewish, Mohammedan, Roman, Julian, Gregorian and World.

Course-103 Major: Introduction to Physical Environment
Unit: 1, Credit Hours: 4; Marks: 100

1. Physical Geography- definition, history and development. Classification-lithosphere, hydrosphere, atmosphere and biosphere: Definition and explanation.
2. The nature and position of physical geography. Explanation in physical geography. The systems approach to physical geography; morphologic cascading, process, response, control systems and ecosystems; open, closed and isolated systems, positive and negative feedback in systems.
3. Origin of the earth, different theories, interior of the earth-seismology, isostacy; present position of the earth- continental drift theory, plate tectonics.

4. Composition of the earth's crust - endogenetic process, faulting and folding and landforms produced by volcanic activities and earthquake.
5. Exogenetic processes-agents of earth's sculpture- rivers, glaciers, winds and waves.
6. Hydrosphere: Hydrological cycle-surface and subsurface water, their distribution and characteristics.
7. The atmosphere: Its structure and composition. Factors and elements of weather and climate.

Course-104 Major: History of Bangladesh
Unit: 1, Credit Hours: 4
Marks: 100

1. Early historical references of the country and its inhabitants.
2. Ancient Bengal and its Influence in South and Southeast Asia.
3. Early Kingdoms in Bengal: A brief outline of the empires of Mauryas, the Guptas, the Pala and the Senas.
4. A brief history of Muslim Rule in Bengal.
5. A brief history of the Mughal Bengal (1526–1757).
6. The East India Company and the British colonisation of Bengal.
7. British government in the sub-continent and events leading to independence in 1947.
8. Bangladesh during Pakistan period (1947–1971): political mobilization and events leading to Independence; the Language Movement, the six points and eleven points movement and the mass upsurge in 1969.
9. Emergence of Bangladesh: factors leading to the freedom struggle. The declaration of Independece, the Independence Charter and the Mujibnagar Government. Armed resistance and military organization of the War of Independence and the final victory.

Course-105 Minor: Plant Geography
Unit: 0.75, Credit Hour: 3; Marks: 75

1. Plant Geography: Definition and elements of plant geography.
2. Biosphere: Plants and animals- similarities and dissimilarities. The terrestrial plant cover. Taxonomic distribution of plants. Floristic or structural approach. Geographical aspects and classification of plants.
3. Plant response to environment-habitat factor, climatic factor and biotic factors and plants physiological response.
4. Plant Adaptation, Plant Association, Communities and Succession:
   (a) Forest communities- types of forests and their characteristics.
   (b) Grassland and scrubland-temperate grassland and tropical scrubland.
   (c) Desert communities.
   (d) Plants of hills and mountains-factors and distribution.
5. Vegetation and Plants of Bangladesh.

Course-106 Minor:
Statistical Techniques in Geography
Unit: 0.75, Credit Hour: 3; Marks: 75

1. Statistical Techniques: Definition, nature and importance. Sources and classification of data. Nature of geographical data. Scientific analysis of data in Geography. Measurements and scaling techniques. Sampling fundamentals.
2. Summarizing Data: Frequency distribution: Meaning, type and steps of construction of a frequency table. Graphical presentation of data. Measures of central tendency: Mean median and mode. Requisites for an ideal measure. Merits, demerits and properties. Measures of dispersion: types, ideal measures, coefficients of dispersion. Moments, skewness and kurtosis.

3. The normal frequency distribution curve and its characteristics.
4. Correlation: Definition, meaning and type. Scatter diagram. Karl Pearson's coefficient of correlations. Rank correlation. Spearman's rank correlation coefficient. Significance test and uses.
5. Regression: Definition. Linear regression. Least square regression for two variables. Regression coefficients. Residuals, Standard error and confidence limit.

Course-107 Minor: Economic Elements in Geography
Unit: 0.75, Credit Hour: 3; Marks: 75

1. Economic Principles: Elements of market equilibrium, demand and supply, elasticity of demand and supply. Utility - marginal utility, law of diminishing and marginal utility and returns. Consumer's surplus. The indifference curve; changes in the income and price, price effect, substitution effect, income effect and the principle of comparative advantage. Theories of rent: David Ricardo, Von Thunen and Sinclair.
2. Production Cost: The production function-least cost factor combination for given output. Equal product and equal cost contours. Least cost conditions. The long run total, average and marginal cost curves- the profit maximizing outputs, short run cost, fixed and variable cost.
3. Market Structure: Types of market condition, competition and equilibrium under different types of competition. How imperfect competition affects resource allocation markets as spatial units.
4. Theory of income determination; macro-economic concepts like savings, investment, employment GDP, GNP, national income and per capita income.
5. Measurement of economic aggregates- index number-national income accounting.
6. Concept and types of economies.

Course-108 Minor: Elements of Geology and Soil
Unit: 0.75, Credit Hour: 3; Marks: 75

1. Introduction to Geology: Definition, geo-internal structure, composition of earth and geological time scale.
2. Structural Geology: A short study of major structural features, such as folds, faults, cleavage and unconformities.
3. Mineralogy and petrology: Definition of rocks and minerals, characteristics and composition of rocks and minerals and classification of rocks.
4. Soil: Definition, formation processes, composition and profile development.
5. Soil Properties: Physical, chemical and biological properties.
6. Generalized classification of soil.

N.C. 109 (E): English Language (non credit)

This is a non-credit course particularly designed for the 1st Year B.Sc. Honours students of the Department of geography to help improve understanding, reading, writing and speaking capability of English.

A. Vocabulary: Word-form and function (these items are to be taught as both discrete ones and in contexts using examples.)

B. Structure: Basic grammar of sentence structure.

C. Comprehension and Translation.

Based on sections A, B and C: A variety of questions chosen from the following types are to be used for reading, writing and speaking tests.

Reading:

Texts are to be taken from magazines, journals, books, and newspapers. All the topics are of general and subject interest.

- Identification of writer's views/claims - yes, no or not given
- Identification of information in the text - yes, no or not Given/true, false or not given

Writing:

- Multiple choices
- Short-answer questions
- Sentence completion
- Notes/summary.
- Paragraphs for translation

It is suggested that the students describe some information (geographical graph/table/chart/diagram), and to present the description in their own words. Depending on the type of input and the task suggested, students are assessed on their ability to:

- organize, present and possibly compare data
- describe the stages of a process or procedure
- describe an object or event or sequence of events
- explain how something works

Speaking:

Assessment of how effectively candidates can communicate in English.

- Introduction and interview
- Examiner introduces him/herself
- Examine students using verbal questions selected from familiar geographic topics.

Practicals:
Unit: 1.5, Credit Hours: 6; Marks: 150

A: Principles of Cartography

1. Cartography: Definition, importance, history of cartography. Modern cartography. Essential cartographic processes.
2. Maps: Definition, classification and characteristics and uses; isopleths choropleth and chorochromatic maps.

3. Materials and Techniques: Drawing instruments and drawing media. Mechanical and free hand lettering.
4. Map Design: Concepts, positioning of frames and panels, legends, symbols. graphs and diagrams on maps.
5. Map Scale: Methods of showing and drawing graphic scale; scale factor, change of scale, combination of scale, measurement of area: graphical and instrumental.
6. Definition and the principles of computer cartography:

   The benefits of computer cartographic method over conventional cartographic method, computer cartographic hardware, computer cartographic software and the application of computer cartography.

B: Analysis and Interpretation of Relief and Maps.

1. Various techniques of representing relief and landform features with their merits and demerits, contour, hachure, shading, layer tint. Form lines: Construction of form lines and contours, contour interpolation; conversion of gradient into angle of slope, finding slope from contours, vertical exaggeration of the scale and intervisibility study.
2. Perspective and pictorial maps.

C: Field Work : Resource Survey of an Area. (Not more than 2 days)

Important : Students have to submit their records of practical works and report of field work before the commencement of practical examination.

B.Sc. Honours Part-2 Examination - 2010

Course No.	Title of the Course	Unit	Full Marks	Credit
Geo-201 Major:	Geomorphology and Oceanography	1	100	4
Geo-202 Major:	Climatology	1	100	4
Geo-203 Major:	Human and Economic Geography	1	100	4
Geo-204 Major:	World Regional Pattern	1	100	4
Geo-205 Minor:	Zoogeography	0.75	75	3
Geo-206 Minor:	Computer Techniques in Geography	0.75	75	3
Geo-207 Minor:	Mathematics in Geography	0.75	75	3
Geo-208 Minor:	Social Geography	0.75	75	3
Practicals:				
A:	Map projection; construction, reproduction and transformation of maps	1.5	150	6
B:	Surveying-I			
C:	Fieldwork: Landscape and Resource Mapping (Not more than 2 days)			
	Viva-voce	0.5	50	2
	Class Records etc	0.5	50	2
	Total Credit	**9.5**	**950**	**38**

Course-201 Major: Geomorphology and Oceanography
Unit-1, Credit Hours-4; Marks-100

A. Geomorphology:

1. Definition of geomorphology; its scope, history of development and recent trends. Some fundamental concepts.
2. Geomorphic processes-Epigene; gradation-degradation and aggradation processes- erosion, transportation and deposition.
3. Gravitational transfer-mass movement and slope movement.
4. Concept of erosion cycle; interrupted cycle of erosion, change in base level.
5. Agents of gradational processes.

   a) River, its pattern, drainage system, landform characteristics, rejuvenation and profile of equilibrium.

   b) Glaciers, its types, landform characteristics. periglacial landforms.

   c) Action of wind-landform characteristics;

   d) Coastal landforms-wave action.

6. Climatic and geomorphic processes-morphogenetic and morpho-climatic regions.

B. Oceanography:

Definition; distribution of world land and water bodies. Oceans-nomenclature; shape, size and volume. Elementary knowledge on the origin of oceans and ocean water. Composition of ocean water.

Relief of the ocean floor-continental shelf, continental slope, Mid-ocean ridge, gyot, sea mount, deep sea plain and trenches. Temperature and salinity of ocean water- horizontal and vertical distribution of temperature and salinity in different oceans, Wave and currents–causes and effects. Movement of water-horizontal and vertical. Distribution and characteristics of ocean currents, tide-origin; tidal waves-spring and neap tides. Oceanic deposits-

classification. characteristics of different types. Distribution of deposits in different oceans. Coral reefs-origin, classification-characteristics of different types.

Region of the oceans, Basis of classification. Characteristics of the regions.

Course-202 Major: Climatology
Unit: 1, Credit Hours: 4; Marks: 100

1. Introduction to Climatology: Scope and methodology.
2. Atmosphere: Composition and structure of the atmosphere.
3. Weather and Climate: Factors and elements, solar radiation and distribution of insolation, temperature, heat balance of the earth, pressure, inversion of temperature.
4. Atmospheric Moisture: Hydrological cycle, humidity, evaporation and evapotranspiration, condensation, clouds and precipitation, rainfall, fogs, dew, frost.
5. Atmospheric Motion: Laws of horizontal movement, the pressure gradient, the earth's rotational deflective and frictional forces, the geostrophic wind, divergence and convergence. Air stability and instability, air mass and air fronts. Adiabatic process.
6. Atmospheric Circulation: Jet Stream, ITCZ, cyclone and anticyclone, land and sea breeze, mountain and valley winds, thunderstorms, tornado.
7. Climatic Classifications: Koppens and Thornthwaites.
8. Climate Types: Mediterranean, Equatorial, Monsoon, Desert and Polar climates.
9. Changes of Climates: Theories and evidences of the changes of climates.

Course-203 Major: Human and Economic Geography
Unit:l, Credit Hours: 4; Marks: 100

1. Human Geography: Definition, scope and methodology, basic concepts, different branches of human geography.
2. Human occupancy of the earth, man-environment interaction; man and the ecosystem.
3. Human Population: Population, size and distribution; structure and dynamics of population, migration.
4. Human Settlement: Forms and pattern.
5. Economic Geography- its definition, scope and methodology.
6. Economic activities - Its classification. Agriculture- its classification, characteristics, major agricultural crops and its physical and socio-cultural determinants. Structural and locational attributes of agriculture in the developed and developing countries. Forest and marine resources including fishing.
7. Minerals and power resources-its exploitation. Growth and development of manufacturing industry. Major industrial regions of the world.
8. Transportation and Trade: Basic principles and characteristics. Means of transportation and their relative merits and demerits. International trade and trade routes.

Course-204 Major: World Regional Pattern
Unit: 1, Credit Hours: 4; Marks: 100

1. The Concept of Region: Definition, Objective and Subjective Approaches; The Concept of Region in Geographic Analysis; Hierarchy and Types of Region; Purposes and Objectives of Regionalization; Methods of Delineating Regions.

2. World Regional Pattern (Natural): Concepts and Definition of Natural Region; Major Natural Regions of the World: Thermal, Climatic, Vegetational and Soil Regions; Distribution of Mineral Resources.

3. World Regional Pattern (Human): World Population Region: Distribution, Density and Characteristics; Concepts and Characteristics of Culture, Race, Religion and Language; Major Cultural Regions of the World; World Urbanization.

4. World Regional Pattern (Economic): Agricultural; Industrial and Trade.

5. Regionalization on the Basis of Development Levels: Definition of Development; Rostow's Stages of Economic Growth; Measures of Development Levels; Identifying the Development Gap; Characteristics of Developed, Underdeveloped, Less Developed and Underdevelopment; First, Second and Third World.

6. Regionalization on Different Perspective: Basic Data and Information for Country Profile (Shape, Size, Location, Population, Settlement, Literacy, Resources, Economic activities, GDP); Grouping of Countries; Political Regionalization; Economic Regionalization and Globalization.

Course-205 Minor: Zoogeography
Unit: 0.75, Credit Hours: 3; Marks: 75

1. Concept and scope of zoogeography.
2. Spatio-temporal distribution of animal.
3. Factors and barrier of animal distribution.
4. Zoogeographical Realms: Holoasctic, Paleoaretic; Pangea, Notogea. Six zoogeographical realms: Paleoarctic, Oriental, Ethiropean, Australian, Neoarctic, Neo tropical; physical and faunal characteristic; faunal transition.

5. Continental and Oceanic Fauna: Polynesian; Micronesian, Melamian, Wallacia, Webber's Lines, Lydecar Lines.
6. Gondowanaland Concept.
7. Bio-ecological Regions of Bangladesh.
8. Conservation of Wildlife of Bangladesh.

Course-206 Minor: Computer Techniques in Geography
Unit: 0.75, Credit Hours: 3; Marks: 75

1. Computer Fundamentals: Definition, historical development of computer. Organization of computer education. Basic functions: Processing unit, data storage capability, and input and output mechanism. Memories: unit of memory, ROM and RAM. Application of computer techniques in Geography.
2. Number Systems and Codes: Decimal and Binary, Conversion: Binary to decimal, decimal to binary. Number codes, ASCII code.
3. Computer Software: Classification, operating system software, application software, components and basic functions of DOS, Windows.
4. Data Organization and Database Systems: Common data elements, classification of data elements. The database concept, types of databases, developing a database and database management system (DBMS).
5. Computer Programming Languages: Definition, types. Programming languages for geographers: statements, sample FoxPro Programs.

Course-207 Minor: Mathematics in Geography
Unit: 0.75, Credit Hours: 3; Marks- 75

1. Definition, scope, development and approaches.
2. Basic mathematical concepts- set, van diagram, set theory combination and permutation, logarithm and indices and their application in geographical studies.
3. Matrix and vector analysis.
4. Trigonometrical elements and its Sine, Cosine, Tangent uses in geography.
5. Co-ordinate geometry. Two dimensions: co-ordinates, the straight lines, and circles Three dimension: rectangular co-ordinates, the plane, the straight line.
6. Calculus: introduction to differential and integral calculus.

Course-208 Minor: Social Geography
Unit: 0.75, Credit Hours: 3; Marks-75

1. Social Geography: Definition, nature, scope, and development.
2. Society: Definition, concept, value and norms. Origin, development, types and factors influencing society.
3. Social Systems: Structural elements and functional problems of a social system.
4. Social Change: Social evolution and progress. Theories regarding social change and factor.
5. Social Problems: Nature, classification, causes, major social problems and its solutions; different theories regarding the causes, methods of preventing crime, juvenile delinquency and social planning.
6. Social Aspects of Bangladesh: Pattern, change, problem, and planning.

Practicals:
Unit: 1.5, Credit Hours: 6; Marks: 150

A: Map Projection, Construction, Reproduction and Transformation of Maps

1. Map Projection.

a Map projection: definition, history of development and classification. Deformation in map projection. Analysis of deformation. Different methods of recognizing deformation. Criteria for selecting projections.

b) Major criteria for the construction of projections-latitude, longitude, Central Meridian, standard parallel, scale of the projection.

c) Construction of projections-mathematical and graphical, merits and demerits.
Conical group of projections; Cylindrical group of projections; Zenithal group projections: Polar, equatorial and oblique; Conventional projections.

2. Construction, Reproduction and Transformation of Maps.

A.

i) Drawing of thematic maps: Definition & classification. Qualitative, quantitative, chorochromatic and choreographic maps. Isopleths and choropleth maps- drawing procedure.

ii) Techniques of Statistical Mapping: Qualitative and quantitative distribution maps, dot maps, graduated symbol maps, circle ratio size maps; square, cubes, spheres and other point symbol maps, gradient maps, flow maps.

iii) Map reproductions, printing and non-printing processes.

B. Study of topographical and weather maps.

C. World regional maps.

B: Surveying-I

1. The Shape and Size of the Earth: Geoid and geodesy; geographical co-ordinate system, plane, spherical and rectangular co-ordinates, military grids, state plane co-ordinates. Direction and distance.
2. Definition of Surveying: Types of surveying, geodetic, plane table.
3. Surveying as the basis of large scale maps: The framework of topographical maps; Principles of triangulation; Types of triangulation, topographical principles- major and minor.
4. Methods of surveying: Chain and tape surveying; Plane table surveying.

C: Field Work: Landscape and Resource Mapping (Not more than 2 days)

Important: Students have to submit their records of practical works and report of field work before the commencement of practical examination.

B.Sc. Honours Part-3 Examination - 2011

Course No.	Title of the Course	Unit	Full Marks	Credit
Geo-301 Major:	Geography: Concepts and Methodology	1	100	4
Geo-302 Major:	Hydrology and Fluvial Morphology	1	100	4
Geo-303 Major:	Advanced Economic Geography	1	100	4
Geo-304 Major:	Bangladesh: Physical Environment	1	100	4
Geo-305 Major:	Quantitative Techniques in Geography	1	100	4
Geo-306 Major:	Environmental Geography	1	100	4
Geo-307 Major:	Research Methodology	1	100	4
Practicals:				
A:	Aerial Photographs			
B:	Remote Sensing.			
C:	Surveying-II			
D:	Study of Geological Maps, Identification of Rocks and Minerals.	2.5	250	10
E:	Micro Region Survey: Places of Geographical Interest			
	Viva-voce	0.5	50	2
	Class Records etc	0.5	50	2
	Total Credit	**10.5**	**1050**	**42**

Course-301 Major: Geography: Concepts and Methodology
Unit-1, Credit Hour: 4; Marks-100

1. A Brief History of the Development of Geographical Knowledge and Concepts (including personalities) in all Ages:
   1.1 Ancient period
   1.2 Greek and Roman classical period
   1.3 Dark age of Europe and medieval Muslim periods
   1.4 Age of exploration and its impact

2. A short history of the development of modern geography in Europe, Russia and the USA in the mid 19th and 20th century (upto World War-II). Introduction to the major thoughts and concepts developed in the period with reference to their personalities.

3. Definitions of Geography:
   3.1 Geography as a science
   3.2 Geography as an environmental science
   3.3 Geography as a social science.
   Nature and trends in contemporary geography, scope of contemporary geography and its subject matters.

4. Introduction to the Major Approaches in Geography:
   4.1 Earth-Science approach
   4.2 Regional approach
   4.3 Systems approach
   4.4 Ecological approach
   4.5 Landscape approach
   4.6 Spatial and locational approach
   4.7 Behavioural approach
   4.8 Welfare approach

5. Theories, laws and models in geography and its relevance to environmental studies.

6. The status of geography today and its relevance to society and state.

Course-302 Major: Hydrology and Fluvial Morphology
Unit: 1, Credit Hours: 4; Marks: 100

1. Hydrology: definition, evolution and importance, properties of water and its global distribution.
2. World hydrological cycle, characteristics and elements.
3. Basin hydrological cycles and their characteristics. Elements, precipitation, evaporation, transpiration, infiltration, run off and ground water. Their detailed description and characteristics.
4. Ground Water: Its formation, location distribution and movements.
5. Fluvial Morphology: Definition, evolution and importance in geomorphology.
6. Stream channels and their characteristics
7. Hydraulics of flow-types of flow, velocity and discharge, their measurement and distribution
8. Processes in a channel erosion, transportation and deposition; load its types and characteristics land forms produced and their characteristics.

Course-303 Major: Advanced Economic Geography
Unit: 1, Credit Hours: 4; Marks: 100

1. Concept, scope and methods.
2. Economic system, theories and models in economic geography, the concept of 'system' and systems in economic geography, factors of production.
3. Spatial organization of agricultural production, spatial regularity of agricultural production (Agricultural location theories of J.H. Von Thunen, Sinclair, O. Jonasson, E. M. Hoover, Black, Garrison and Marble).

4. Spatial Organization of Industries: Weber's analysis of minimum transport point; Industrial location theories of Tord Palander, Edgar Hoover, August Losch, Isard's substitution framework, Smith's space cost curve; localized industrial raw materials and the space economy.
5. The central place system, spatial organization of land uses within urban centres, central place hierarchy, theoretical extension of the Christaller model by August Losch, theories of urban structure (Ernest W. Burgess, Homer Hoyt, Chauncy D. Harris and Edward L. Ullman).
6. Movement and interaction in the economic landscape; people, objects and information. Movement and diffusion models, transport system, the location of transportation routes and networks, their form and structure, transportation costs.
7. Regional development- its theories and levels of development, stages of development, cumulative development in space; transmission of growth impulses; centre- periphery relationship.

Course-304 Major: Bangladesh: Physical Environment
Unit : 1, Credit Hours : 4; Marks: 100

1. Introduction: Location of Bangladesh in the region and the world community; characteristics and importance.
2. The Natural Environment: Geological background; Relief and Physiography; Climate, Soils, River systems and wetlands.
3. Natural Resource Bases: land, water, minerals, fuel and energy, forests and fisheries.
4. Natural Hazards: Flood; Cyclone and Tornadoes; Drought; River Bank Erosion; Earthquake; Landslides.
5. Climate Change, its impact and adaptation.

Course-305 Major: Quantitative Techniques in Geography
Unit: 1, Credit Hours: 4; Marks: 100

1. Index number and analysis of time series.
2. Measures of Spatial Distribution: Types of spatial data; point distribution, line distribution-networks, discrete areal distribution (choropleth) and continuous area distribution (isopleth).
3. Probability Distributions: Probability concept- terms, law of addition and multiplication, sample space; probability distributions- normal, binomial and poisson. Properties of normal curve-*Z-scores* and calculation of probability.
4. Samples and Estimates: Populations and samples; sampling frame, sampling types, types of sampling used in the geographical research. Population parameters and sample statistics, sampling distribution and the standard error. Sample size, estimates from sample measurement and sample counts.
5. Hypothesis testing: General consideration; The χ^2 test, binomial test, t-test, the Mann-Whitney U test, the Wilcoxon test for paired samples. Type I and Type II error; the analysis of variance.
6. Test for distribution in space: Concept of spatial randomness, the nearest neighbour index and simple randomization test.
7. Models: The gravity model; diffusion model, slope model and computer operated simulation model.

Course-306 Major: Environmental Geography
Unit: 1, Credit Hours: 4; Marks: 100

1. Environmental geography: Definition, scope, concept and methods. Relationship between geography and environment. Geography and ecology. Elements, types and structure of environment. Environment, man, society and state. Environment and resources.

2. Ecology and ecosystem: Definition, concepts and principles. Ecosystem structures and its atmosphere, hydrosphere and biosphere. Systems in geography-man-environment link; morphologic, cascading, process-response and control systems.
3. Driving forces of ecosystem: Classification of organisms-producers, consumers, detritus feeders and decomposers; trophic levels-interaction between organisms in the ecosystem and related concepts.
4. Ecological background: Matter and energy resources in the ecosystem and the related laws of nature. Ecosystem functions-material and energy flow in the ecosystem, photosynthesis and respiration, production, biomass and consumption. Productivity and climatic elements and soils. Transfer of energy and nutrients-food chain and food web. Biogeochemical cycles or nutrient cycling-carbon cycle, nitrogen cycle, phosphorous cycle and hydrological cycle. Man and environmental processes.
5. Type of Ecosystems: Terrestrial ecosystem or biomes and aquatic ecosystems. Global environmental regions: (a) The low-latitude environments, and (b) the mid-latitude and high-latitude environments.
6. Environmental problems: Global, Regional and local Issues and management: Degradation of soil and hydrosphere, atmospheric changes, loss of biodiversity, the process of a major paradigm shift, agenda 21 and other environmental problems, legal and economic strategies.

Geo-307 Major: Research Methodology
Unit: 1, Credit Hours: 4; Marks: 100

1. Scientific Methods in Geography:

1.1 Concept, definition and elements in scientific method in geography, its philosophy and the general principles of geographical inquiry and the development of scientific method;

1.2 Theory and Techniques of Spatial Analysis: A Review of the Development of different Research Paradigms and the Role of Geographical Schools of thought in Formulation of Theory, Model building;

1.3 The Research Process- The Cyclic Process of Research Projects and Steps in Research.

2. Formulation of a Geographical Research Thesis/Project Proposal.

2.1 Definition of Research Thesis/Project;

2.2 Research Design: Structure of a Research Project Programme Schedule, Monetary Budget.

3. Geographical Research Methods and Analysis:

3.1 Methods of Data Collection:

(a) Survey Research-Construction of Questionnaire and Interview;

(b) Action Research;

3.2 Methods of Data Analysis:

(a) Selection of Suitable Methods [Experimental, Nonexperimental Methods i.e., Statistical, Mathematical, Laboratory Methods etc];

(b) Data Processing and Analysis;

(c) Presentation of Statistical Data.

4. Format of Geographical Research:

4.1 Format and Styles of a Geographical Research Thesis/ Project;

4.2 Bibliography, Endnotes, Footnotes, Abstract, Appendixes.

5. Project based Policy Research-

a) Characteristics of Policy Research and Research Environment;

c) Implications for the Research Process;

d) Some Contributions of Policy Research.

6. Utilization of Research Findings.

Practicals:
Unit:2.5, Credit hour: 10; Marks: 250

A: Aerial Photographs

1. Aerial photograph as a tool in geography.
   a) Nature, types and importance of aerial photographs.
   b) Acquisition and Coverage
   c) Interpretation techniques and equipment
   d) Interpretation of aerial photograph-determination of base-line, orientation, determination of scale, scale displacement, relief displacement.

2. Application of aerial photographs in the study of geography and environment.

B: Remote Sensing

1. Introduction to satellite Remote Sensing: Fundamental considerations; sensors/platform systems, satellite imagery, technical specification of satellite data.
2. Digital image processing, satellite data correction, data restoration, data enhancement, data classification and feature recognition techniques.
3. Interpretation of remote sensing data from hardcopies.
4. Application exercise: Land cover and land use, environment monitoring, geologic feature identification and environmental management.

C: Surveying-II

1. Prismatic compass survey
2. Leveling
2. Theodolite survey
3. Introduction to GPS and total station.

D: Study of Geological Maps and Identification of Rocks and Minerals

E: Micro Region Survey:
Places of Geographical Interest

Important: Students have to submit their records of practical works and report of field work before the commencement of practical examination.

B.Sc. Honours Part-4 Examination – 2012

Course No.	Title of the Course	Unit	Full Marks	Credit
Geo-401 Major:	Geography of Resource Management	1	100	4
Geo-402 Major:	Population Geography	1	100	4
Geo-403 Major:	Political Geography	1	100	4
Geo-404 Major:	Bangladesh: Human and Economic Environment	1	100	4
Geo-405 Major:	Cultural Geography	1	100	4
Geo-406 Major:	South Asia (excluding Bangladesh)	1	100	4
Geo-407 Major:	Project	1	100	4
Practicals:				
A:	Morphometric Analysis			
B:	Environmental Analysis			
C:	Geographical Information System and its applications	2.5	250	10
D:	Field Techniques in Geography			
E:	Micro Region Survey: Environmental and Spatial Perspective			
	Viva-voce	0.5	50	2
	Class Records etc	0.5	50	2
	Total Credit	**10.5**	**1050**	**42**

Course-401 Major: Geography of Resource Management
Unit-1, Credit Hour: 4; Marks-100

1. Fundamentals of Resource and its Management: Definition and concepts, scope and approaches. The evolution of the field of resource management. Resource allocation.
2. Resource Classification: Resource ecosystem; basic terms; Marine resources, natural resources; renewable and non-renewable resources. Nature of resources.
3. Resource Appraisal, Forecasting and Monitoring: Methods and techniques. Population-Resource nexus.
4. Concepts of sustainability, carrying capacity, perception, attitude and adjustment in resource management.
5. Resource Conservation: Meaning; strategies and techniques, Important resources and their conservation strategies with particular reference to Bangladesh.
6. Resource Planning and Management: Concept and approaches. The planning cycle; Models in planning.
7. Perspectives on the Future Resources: salient trends; social order; institutional reforms; policy making; international order and co-operation.

Course-402 Major: Population Geography
Unit-1, Credit Hour: 4; Marks-100

1. Population geography, definition, scope and methodology.
2. Sources of population data.
3. Population distribution and density, measures of spatial variations, determinants of such variations.
4. Population Growth: Forces, trends, future prospects of population theories, policies and control measures.
5. Population growth and development.
6. Population Dynamics: Fertility, mortality and migration.

7. Population structure and composition.
8. Impact of urbanization on population, population growth and structure.
9. Population and resources.
10. Population estimates.
11. Population policies.

Course-403 Major: Political Geography
Unit-1, Credit Hour: 4; Marks-100

1. Political Geography; Definition, scope, methodology historical growth, major approaches and importance.
2. Political Regions: continents and other nominal political entities; state and other political areas; classical and marxist concept of state, Jones, Unified Field concept; factors and forces of political evolution of space.
3. Individual, Society and State Relationship: Human rights-Magnacarta-the French declaration- the American Four Freedoms-the U.N. declaration of human rights.
4. Fundamental Elements of State: territory-spatial and non human environmental features; population and human features- nations - sub nations-tribal communities-irridentism and integration problems; state functioning- govt. types and fundamental organs-major institution and their political role- civil service, police, central bank, election commission, public service commission, census commission, the universities; the basic governing principles-constitution; Freedom and the concept of sovereignty, public representation-electoral districts, gerrymandering, political party system-suffrage right-electorate-the representing of the nonpolitical groups.
5. Structure of State and other Political Areas: Geopolitical and political-administrative divisions-capitals, core areas, peripheral and frontier zones; province and power decentralization- lesser

political areas, special regions-river valley authorities, urban greenbelts, railway zones, economic development regions.

6. The State and the World: International trade-the free economy-WTO; developed and developing world- power concepts and geopolitics; geo-strategy and cold war; the emergence of NAM; the concepts of disarrangement and non-intervention and global cooperation; supranationalism-economic alliances, protection of global environment-the Rio declaration.
7. International Relations and Peace: Normal growth of interstate relations-the use of international canals-the use of nuclear reactors and explosion and their consequences. Interstate claims and conflicts- international tensions, the role of the world court and the U.N.O. in conflict resolution and promotion of stable peace.

Course-404 Major: Bangladesh: Human and Economic Environment
Unit: 1, Credit Hours: 4; Marks: 100

1. Human resources of Bangladesh**:** characteristics and constraints of development.
2. Population and settlement: Spatial patterns of distribution and density; Population dynamics; Settlement patterns and Urbanization.
3. Major economic activities: Agriculture: growth and change, major crops, agro-ecological zones and Crop Association Units; Land use and Land Degradation. Manufacturing: growth, development, constraints and spatial distribution; Service activities: formal and informal.
4. Problems and issues of development: Regional inequality and regional development; Poverty: progress in reduction and spatial patterns; Food Security.
5. Major issues of environmental concern: Pollution: land, water, air and noise; Issues of Arsenic contamination of groundwater and its impact on health; Impact of major engineering projects on the environment with special reference to FCD/FCDI projects; Major regions of environmental concern.

Course-405 Major: Cultural Geography
Unit: 1, Credit hour: 4; Marks: 100

1. Cultural Geography: Definition, meaning, scope and significance.
2. Culture: Definition, meaning, elements, cultural development acculturation.
3. Origin of Man
4. Ancient Culture: Paleolithic, Mesolithic and Neolithic.
5. World Civilization: Greek, Egyptian, Mesopotamian, Indus Valley, and Chinese.
6. Culture of ethnic minorities in Bangladesh.
7. Significance of the preservation of archaeological heritage of Bangladesh.

Course-406 Major:
Regional Geography: South-Asia (excluding Bangladesh.)
Unit: 1 Credit Hours: 4; Marks: 100

Course-407 Major:
Project:
Unit: 1 Credit Hours: 4; Marks: 100

Practical:
Unit:2.5, Credit hour: 10; Marks: 250
A: Morphometric Analysis

1. Fieldwork on physical landscape study.
2. Study and interpretation of various types of landforms using toposheets (by cross profiles), serial, composite, superimposition and projected mapping, hypsographic curve and long valley curve (Thalweg).

3. Stream ordering and laws of drainage composition.
4. Slope aspects, spatial distribution and methods of slope analysis (Henry, Raisz, Robinson and Strahler)

B: Environmental Analysis

1. **Geographical Exercise:**

1.1. Topographical and hydrological change detection on the basis of old and current topographical maps and also on existing field situation (visual comparison).

1.2. Preparation of geomorphological maps of a given village on the basis of field survey, using chain and tape and topographic survey using theodolite.

1.3. Field work

2. **Hydrological Exercise:**

2.1 Preparation of stage hydrography/flood frequency curves on the basis of hydrological data of a river station (BWDB data).

2.2 Analysis of stream flow and drainage characteristics of a river using conventional tools and techniques as well as using remotely sensed images. Study features include fluvial-geomorphic profiles of the stream.

3. **Sedimentological Tests:**

3.1 Identification of sand, silt and clay by manual techniques and instrumental techniques.

3.2 Studies on the texture, structure, colour, organic matter and composition. pH physical (pH meter) and chemical tests on the basis of conventional, traditional and modern scientific techniques.

3.3 Measurement/extent of the horizons

3.4 Identification of characteristics.

4. **Floral and Faunal environmental tests:**

4.1 Species identification with reference to different land levels (viz: high, medium, low etc.) and physiographic units, like (a) species of hills or terrace lands, (b) species of plain alluvial lands (c) species of marshes/swamps or other low lying surfaces.

4.2 Study the relationship between occurrence of vegetation species and soil types of specific study areas viz. loamy, secondary and salty-clay regions.

C: Geographical Information System and Its Applications

1. Familiarity with basic GIS techniques and approaches
2. Data Management in GIS: Identification of data sources, data types, data input, storage, manipulation and output.
3. Software Use: Arc Info, Arcview and Cartalinx.
4. Preparation of paper map, map digitization, correction, attributes data attachment, preparation and reproduction of simple thematic maps.
5. Decision support system.

D: Field Techniques in Geography

1. Field Techniques in Geography-including field observation, sketches, drawing, measurement, interviewing, photo taking, surveying- preliminary and detailed.

E: Micro Region Survey: Environmental and Spatial Perspective

Important: Students have to submit their records of practical works and report of field work before the commencement of practical examination.

Books recommended:

A brief government report on the background of UN Mother Language Day: http://www.pmo.gov.bd/21february/index.htm

A resourceful site for bibliographic references: http://www.questia.com/SM.qst

Abler, Adams, J. and Gould, P.: *Spatial Organization*: The Geographer's Views of the World.

Adams, W.M.: *Green Development*: Environment and Sustainability in the Third World.

Ahmad Kamruddin (1975): A Socio-Political History of Bengal. Dhaka: Inside Library.

Ahmad, Nafis (1976): *A New Economic Geography of Bangladesh*, Vikas, New Delhi.

Ahmad, Q.K. etal (ed.) (2000*) Perspective on Flood 1998*, UPL.

Ahmed, K.S.*: Simple Map Projection*

Ahmed, Nafis: *Muslim Contributions to Geography.*

Ahmed, Salahuddin (2004) Bangladesh- Past and Present: Paragon Publishers; Dhaka. Asiatic Society of Bangladesh; Second Edition.

Ahmed, Salahuddin (2004) Bangladesh Past and Present: Paragon Publishers; Dhaka, Asiatic Society of Bangladesh; Second Edition

Aime Vincent Perpillon: *Human Geography*, Longman.

Alexandersson, G. (1964) *Geography of Manufacturing*, Prentice-hall, inc.

Ambrose, Peter: *Analytical Human Geography*.

Arms, Karen (1996): *Environmental Science*; Holt, Rinehart and Winston Inc. N.Y.

Ashton. T.S. (1972) *The Industrial Revolution* 1760-1830. Oxford University Press, London.

Avery, T.E.: *Interpretation of Aerial Photographs*, Burger Publishing Co. USA, 1965.

Balc, John. (1981) *The Location of Manufacturing Industry, Olives & Boyd.*

Banglapedia: National Encyclopedia of Bangladesh. It can be most easily accessed on: http://www.search.com.bd/banglapedia

Barke, M and Hare G (1993) The Third World: Diversity, Change and Interdependence, Oliver and Boyd.

Baver, L.D.:*Soil Physics*, John Wiley and Sons, Inc. New York.

Berry & Chorley: *Atmosphere, Weather and climate*

Blunden,J. e.al.: *Fundamentals of Human Geography*, Harper & Row, London, 1979.

Brammer, H.: *The Geography of the Soils of Bangladesh*, University Press Ltd. Dhaka.

Brinton, C. et al.: A History of Civilization. Prentice Hall, N.J. 1976.

Brown R.P. & Brown B.W.(1980): *Mathematics: Applied to Business & the Social Sciences*, Wadsworth Publishing Company.

Bryant, Richard H. ( ) Physical Geography:

Bungee, William: *Theoretical Geography.*

Burrough, P.A.: *Principles of Geographical Information Systems for land Resource Assessment*, Oxford: Clarendon Press.

Burton, I and Kates, R.W.- *Readings in Resource Management and Conservation.*

Bygott, John: *An Introduction to Mapwork and Practical Geography*

Chisholm, M. (1970): *Geography and Economics*, G. Bell.

Chorley, R.J. and Haggett, Peter: *Frontiers in Geographical Teaching.*

Chowdhury, Abdul Momin (1967) Dynastic History of Bengal: c. 750-1200 A.D.; (includes an outline discussion of pre-750 AD period) Asiatic Society of Pakistan; 'Dacca'.

Chowdhury, Abdul Momin (1967) Dynastic History of Bengal: c. 750-1200 A.D.; (includes an outline discussion of pre-750 AD period) Asiatic Society of Pakistan; 'Dacca'.

Cole J.P (1974) Geography of World Affairs: Penguin Books.

Covering aspects of society and culture: http://www.virtualbangladesh.com

Crithfield, H.: *General Climatology*, Prentice Hall, New York.

Darlington: *Zoogeography.*

Dd Blij, Harm, J (1971) Geography Region and Concepts, John wiley, New York.

DeBlij H.J.: *Human Geography Culture*, Society & Space, Wiley, 1977.

Dickinson, G.C.: *Maps and Air Photographs*, Edward Arnold, 1967.

Dickinson, R.E (1970) Regional Ecology: The study of man's Environment. John Wiley, New York.

Dickinson, R.E.: *City and Region.*

Dickinson, Robert E.: *The Makers of Modern Geography.*

Dohrs and Sommers (1976) World Regional Geography: A Problem Approach, West Publishing Co.

Eaton, Richard M (1993) Rise of Islam in the Bengal: Frontier 1204-1760; Berkley: University of California Press; 1993 [This book can be read online at http://ark.cdlib.org/ark:/13030/ft067n99v9/]

Emays, Jones: Human *Geography*, Chatto and Windus, London.

Estall, R.C. & Buchanan, (1977) *Industrial Activity and Economic Geography*

Fielding,G,J. (1974) Geography as Social Science, Harper and Raw, Publishers.

Finch, V.C. (et.al): *Physical Geography*; McGraw Hill, New York.

Garnier, J. Beaujeu (1976) Methods and Perspectives in Geography, Longman.

Gates, E.S.: *Meteorology and Climatology*, George G. Harrap & Co. Ltd. London.

Gay P & Webb R.K: Modern Europe since 1815, Harper.

Gottfried, B.S (1991*) Theory and problems of programming with Basic*: Tata Mc- Graw-HallPub.Company Ltd, India.

Gregory et.al: *Drainage basin: forms & Process.*

Griffiths, J.F.: *Applied Climatology*: An Introduction, O.U.P.

Haggett, P.: *Geography: A Modern Synthesis.*

Haggett, P.: *Locational Analysis in Human Geography.*

Haggett, Peter (1979) Geography A Modern Synthesis:

Hardy, M.E., *The Geography of Plants*, Clarendon Press, Oxford, 1920.

Haroun-er-Rashid: *Geography of Bangladesh, UPL, Dhaka.*

Hartshorne, R.: *Perspective on the Nature of Geography.*

Harvey, David: *Explanation in Geography.*

Harvey, J., (1989): *Mastering Economics*, Macmillan Edu. London.

Healey & Ilbery, (1990) *Location and Change. Oxford University Press, London.*

Herbertson, A.J.: *The Major Natural Regions of the World*, Geographical Journal XXV (1905).

Historical Atlas of South Asia.

History of Bangladesh and Ancient World Civilizations: National Curriculum & Textbook Board; Dhaka; Second Edition 2002

Holmes, A.: *Principles of Physical Geology.*

Hoyle, B.S (ed) (1973) *Transport and Development.*

http://www.blss.portsmouth.sch.uk/hsc/cultural/bangladesh.html

Information, from maps to music, about Bangladesh; see mainly for cultural aspects: http://www.bangladesh.com

Interesting reading of Bangladeshi festivals:

Islam, M. Aminul: *Government, Landuse & Natural Hazards in Bangladesh*, University of Dhaka.

Islam, Mustafa Nurul (ed), Bangaleer Attayaparichay.

Islam, Sirajul (1997) History of Bangladesh: 1704-1971 (3 volumes);
Islam, Sirajul (1997) History of Bangladesh: 1704-1971 (3 volumes).

Islam, Sirajul (2003) Banglapedia: National Encyclopaedia of Bangladesh: 10 vols.; Asiatic Society of Bangladesh.

J.O.M. Brock & Webb: *A Geography of Mankind*, New York.

James P.E. A: *Geography of Man* Blaisdall Publishing Company.

Jarrctt. H.R. (1977) *A Geography of Manufacturing. Macdonald & Evans*

Johnson, B.L.C (1975): *Bangladesh, Heinemann, London.*

Johnston, R.J.: *Multivariate Statistical Analysis in Geography*, Longman, USA.

Kannan, K.: *Fundamentals of Environmental Pollution.*

Karim, Abdul (1977) Banglar Itihas: Sultani Amal: (History of Bengal During Sultanate Period); Bangla Academy; Dhaka; (in Bengali)

Karim, Abdul (1977) Banglar Itihas: Sultani Amal: (History of Bengal During Sultanate Period); Bangla Academy; Dhaka; (in Bengali)

Kliot, Hurst (ed) (1974) *Transportation Geography:* comments and readings.

Koeppe, C.E. and De Long. G.C.: *Weather and Climate*, MaGrow Hill, New York.

Koromondy, E.J.: *Concept of Ecology.*

Lockwook: World Climatology: *An Environmental Approach.*

Lowe, J.C & Moryadas (1975) *The Geography of Movement Houghton Mifflin Company*, Boston

Mahmood, A.: *Statistical Methods in Geographical studies*, Rajesh Publications, India.

Maniruzzaman, Talukder (2003) The Bangladesh Revolution and its Aftermath: Second impression.University Press Ltd; Dhaka;

Marbat, C.F.: *Soils:* Their Genesis and Classification, USA.

Mather, P.M.: *Computer Applications in Geography*, Chichester: John Wiley & Sons.

McGuire, D.J.: *Computers in Geography*, New York: Longan Scientific & Technical.

Miah, M. (1989*): Flood in Bangladesh*, Academic Publishers, Dhaka, December.

Michael Borok and Greg. O.Hare: *The Third World: Conceptual Frameworks in Geography*, Oliver and Boyd.

Michael, Bradshaw (1997)- A World Regional Geography, Brown and Benchmark.

Minshull, Roger M.: *The Changing Nature of Geography*

Mitchel, B. : *Geography and Resource Analysis.*

Monkhouse, F.J.: *Maps and Diagrams*

Mountjoy, S.B. (1966) *Industrialization and Underdevelop-ment Countries. Hutchinson, London.*

Muir,R.: *Modern Political Geography*, London, 1975

Muslim Society and Politics in Bengal A.D. 1757-1947; Muhammad Abdur Rahim; University of 'Dacca'.

National Academy of Sciences USA : *The Science of Geography*.

National Curriculum and Textbook Board (2002): History of Bangladesh and Ancient World Civilizations; Dhaka, Second Edition.

Nebel, B.J. & Wright, R.T. (1996*): Environmental Science: The Way the World Works*; Fifth Edition, Prentice Hall, N.J.

Newbigin, Marion., *Plant and Animal Geography*, Methuen and Co. Ltd. London, 1968.

O' Brien, J.A.(1986). *Computers and information processing*, Richard D. Irwin.inc. USA.

Omara- Ojungu, P.H.: *Resource Management in Developing countries.*

Palmer, R.R. (ed): Atlas of World History; Rand Mc Nally, N.Y.

Patric, J.Mc. Bridge: *Human Geography*, Principles, Processes and Patterns, Blackie and Sons Ltd.

Peuquet, D.J. & Duane, F. Marble: *Introductory Readlngs in Geographic Information Systems*, London: Taylor & Francis.

Polunin, Nicholas: *Introduction to Plant Geography*, Longmans, Green and Co. Ltd. London, 1967

Pounds, N. (1981) *Economic Geography*. John Murvay.

Pounds, N.J.G.: *Political Geography*, McGrow Hill, 1972

Pounds, Norman (1981) Succers in Economic Geography.

'Rafique: Encyclopaedia of History Pau Dock: Homework, Housework.

Rahman, Mahbubur, 2003. Bangladesher Itihas. Samay Prakashan, Dhaka.

Raize, E.: *General Cartography*

Ray Atul Chandra (1968) History of Bengal: (Mughal Period 1526-1765) Nababharat Publishers; Calcutta.

Ray Atul Chandra (1968) History of Bengal: (Mughal Period 1526-1765) Nababharat Publishers; Calcutta.

Ray, Niharranjan (1978) History of the Bengali People: Orient Longman; Hyderabad; 1994

Rice, R.J. *Fundamentals of Geomorphology*.

Richardson, H.W (1969) Regional Economics: Weidenfeld and Nicolson, London.

S. Gregory: *Statistical Methods and the Geographer*, Methuen, New York, USA.

Silk, G. : The Big Bang: *The Creation and Evolution of the univshed*: W.H. Freeman

Singh, R.L.: *Elements of Practical Geography*.

Singh, S. (1991): *Environmental Geography*; Prayag Pustak Bhawan, Allahabad, India.

Sircar D.C. Studies in the Geography of Ancient and Medieval India, Varanasi, 1960.

Small, R.J.: *The Study of Landforms*, Cambridge University Press.

Smith, D.M. (1970) *Industrial Location*, Wiley International, London.
Smith, V. I. (1989) History of India, Oxford University Press

Smith, V. I. (1989) History of India, Oxford University Press.

Snow, T.P.: *The Dynamic Universe*: *An Introduction to Astronomy*: West Publishing company.

Stein, E.I.: *First course in Fundamentals of Mathematics*. Allyn & Bacon, Inc. 1973.

Strahler, A.H.: *Geography and Man's Environment*, New York, John Willey & Sons.

Strahler, A.N. *Principles of Physical Geography*.

Strahler: *Physical Geography*.

Taylor, Griffith: *Geography in the Twentieth Century*.

Taylor, P.J.: *Quantitative Methods in Geography*. Houghton Mifflin Company, London.

Thronbury, W.D.: *Principles of Geomorphology*; John Wiley, London.

Tozar, F. : *History of Ancient Geography*.

Trewartha, G.T.: *An Introduction to Climate* .

Wadia, D.N.: *Geology of India*, Macmillan & Co, London.

Wheeler, J.H and Kostbade (1990): World Regional Geography, Saunders College Publishing.

Web support:

Yeates, M.: *An Introduction to quantitative Analysis in Human Geography*, McGraw Hill Inc.

Zimmerman, E.W.: *World Resources and Industries*.

†PŠayix, wmivRyj Bmjvg, *A_©bxwZK f,‡Mvj,* Xv. we. XvKv|

Avjx, †gv. gvmyg I Avjg, †gvt byi"j (1995)**:** *evsjv‡`‡ki A_©bxwZ*, AvBwWqvj jvB‡e^{a}ix, XvKv|

Avjx, †K. (1995)**:** *evsjv‡`k I cvK-fvi‡Zi BwZnvm*, Avjx cvewj‡Kkb, XvKv|

Avn‡g`, iKxe, *Gwiqvj d‡UvMÖvd B›UviwcÖ‡Ukb I d‡UvMÖv‡gwU*^{a}

Avn‡g`, iwdK**:** *AvenvIqv I Rjevqy weÁvb*|

Avngv`, bvwdm (Abyev`K: bRi"j Bmjvg I Rvgvj Lvb) **:** *f,‡Mvj weÁv‡b gymjgvb‡`i Ae`vb,* XvKv: evsjv GKv‡Wgx|

Bgvg, e`i"j, *evsjv‡`‡ki LwbR m¤ú`,* evsjv GKv‡Wgx, XvKv|

Bjvnx, gD`y`, **:** *cwimsL¨vb c×wZ I ¯'vwbK we‡k-lY*|

Bmjvg, Gg. Av.: f,‡Mvj**:** *`„wófw½ I `k©b,* fz‡Mvj wefvM, XvKv wek¦we`¨vjq|

Bmjvg, Gg. Av.**:** *m¤ú` e¨e¯'vcbv*|

evKx, Avãyj (2006) ms¯‹…wZK f~‡Mvj, Xv.we.

evsjv‡cwWqv, GwkqvwUK †mvmvBwU KZ…©K msKwjZ|

ikx`, †K.we.Gm**:** *mvs¯K…wZK f,‡Mvj,* evsjv GKv‡Wgx, XvKv|

ingvb, W. nvwmeyi.**:** *mgvR weÁvb cwiwPwZ*|

iwng, gyn¤§` Avãyi I Ab¨vb¨ (2003) evsjv‡`‡ki BwZnvm, bI‡ivR wKZvwe¯—vb, XvKv|

Kwig, †gv. †iRvDj.**:** †*fŠ‡MvwjK Z_¨ e¨e¯'v c×wË*|

†KvwbM, m¨vgy‡qj.**:** *mgvR weÁvb*|

mvjvDwÏb, Gg. (1994)**:** *evsjv‡`‡ki gyw³ msMÖv‡gi BwZnvm*, 1947-71|

nK, †gvnv¤§` jyrdzj I ingvb, †gv¯—vwdRyi (1994)**:** *AvaywbK A_©bxwZ*, evsjv‡`k eyK K‡c©v‡ikb, XvKv|

nvmvb, gvneye I Ab¨vb¨, *evsjv‡`k cÖvK…wZK f,‡Mvj I cwi‡ek,* evsjv GKv‡Wgx, XvKv|

ReŸvi, †gvnv¤§` Avãyj**:** Zviv cwiwPwZ, evsjv‡`k A¨v‡÷ªv‡bvwgK¨vj A¨v‡mvwm‡qkb|

û‡mb, gKeyj**:** mgy`ªwe`¨v|

Zvnv Gg.G.**:** c„w_exi AvÂwjK aiY-2000

Zvnv, Avey (2000) c„w_exi AvÂwjK aiY: iv.we. cvV¨ cy¯—K cÖKvkbv †evW©|

Zvnv, Gg. G. AvKvka„Z gvbwPÎ I †bUIqvK© we‡k-lb, iv.we., cÖKvkbv `ßi|

Zvnv, Gg.G. **:** ivR‰bwZK f,‡Mvj, ivRkvnx, 1988

Zvnv, Gg.G.**:** gvbweK f,‡Mvj

`Ë, KzÛjv jvwnox **:***f,‡Mvj wPš—vi weKvk*, KwjKvZv, Iqvì© †cÖm