UNIVERSITY OF CALCUTTA

Notification No. CSR/ 36 /14

It is notified for the information of all concerned that in terms of the provisions of Section 54 of the Calcutta University Act, 1979, (as amended), and, in exercise of his powers under 9(6) of the said Act, the Vice-Chancellor has, by an order dated 01.09.2014, approved the ***Regulations and syllabus for the M.A./ M.Sc. course of study in Geography*** under this University as laid down in the accompanying pamphlet.

The above shall be effective from the academic session 2014-15 and onwards.

SENATE HOUSE
KOLKATA-700073
The 3rd September, 2014

(Dr. S.K.Barua)

Deputy Registrar

University of Calcutta

Post Graduate Curriculum in Geography ✧ 2014

REGULATIONS

For the Two-year M. A. / M.Sc. Course in Geography

1. The University of Calcutta (C.U.) shall offer the course and provide instructions leading to the two- year M. A. / M. Sc. degree in Geography.
2. A candidate who has passed the three-year B. A. / B. Sc. examination with Honours in Geography of C. U. or equivalent course of other universities recognized by the University of Calcutta will be eligible for admission to this course.
3. A limited number of seats, as per relevant rules and guidelines, will be available to the non-C.U. students. These students, however, will have to satisfy the same eligibility criteria applicable to the students of the University of Calcutta and will be selected through appropriate procedures.
4. Duration of the course shall be of two academic years and the examination for the M. A. / M.Sc. degree in Geography shall be held over four evenly distributed Semesters with a total marks of 1000 equivalent to 100 credits. The structure of the Semesters shall be as follows:

Semester	Duration	Marks		Total	Credit		Total
		Theoretical	Practical		Theoretical	Practical	
First	July - December	200	50	250	20	5	25
Second	January – June	200	50	250	20	5	25
Third	July – December	150	100	250	20	5	25
Fourth	January – June	150	100	250	20	5	25
Total		**700**	**300**	**1000**	**80**	**20**	**100**

5. The course shall include both *Core* (Compulsory) and *Special* (Optional) papers. Each student will opt for only one *Special Paper* in the Third Semester and will continue it in the Fourth Semester.
6. A candidate shall be eligible for appearing at an examination provided she/ he pursues the course regularly maintaining the percentage of attendance as specified by the University.
7. Examinations will be held on theoretical and practical Modules after the completion of curriculum at the end of each Semester. Evaluation of the practical Modules will be based on documented laboratory experiment, field and project/dissertation works, as applicable.

8. Medium of instruction is English, and the answers are to be ordinarily written/ presented in 'English'.
9. A candidate should obtain at least 40percent of the total marks allotted in each Module to qualify in each Semester.
10. If a student fails to qualify in a particular Module of a Semester, she/ he shall get 'F' in that Module only, and shall be required to repeat that Module in the corresponding Semester of the immediately following academic session. A student getting 'F' in a particular Module in both of the above two attempts shall be dropped from the University Rolls.
11. In case a candidate gets 'F' grade in one or more Module (s) in a Semester examination his/ her SGPA (Semester Grade Point Average) in that Semester will be temporarily withheld and GPW (Grade Point Withheld) will be marked against SGPA on the marks sheet. A fresh marks sheet with duly calculated SGPA will be issued when the candidate subsequently clears the Module(s) with Grade 'C' and above.
12. If a student is dropped from the University Rolls because of the failure to clear 'F' and GPW within the stipulated time, s/he may apply for readmission in the First Semester in the beginning of the next academic session as a fresh applicant. In such case, the relevant rules of the University will be applicable.
13. If a candidate has one or more back Module(s) in any Semester, his/ her CGPA (Cumulative Grade Point Average) will remain incomplete (INC) till she/ he clears the back Module(s). The CGPA will be marked as 'INC' on the mark sheet. Fresh mark sheet with duly calculated CGPA will be issued only after she/ he subsequently clears the back Module(s) within the stipulated time.
14. It is mandatory to clear all of the three previous Semesters before the Fourth Semester result of the candidate is published.
15. Both SGPA and CGPA will be rounded off to the 'second place' of the decimal and recorded as such.
16. Final merit list will be prepared on the basis of CGPA starting from the First Semester through the Final Semester, provided that students having back courses shall be excluded from such merit list.
17. A student securing a CGPA of 'C' or above shall be considered as to have cleared the course.
18. Paper-setters for each Module will include both internal and external examiners appointed on recommendation of the Board of Post Graduate Studies (PGBoS) in Geography. A Board will be constituted comprising of both internal and external members to moderate the question papers of the theoretical modules. Each question will be composed of at least two parts. Out of two questions in each unit the candidates will answer any one.
19. Evaluation of the answer scripts pertaining to theoretical Modules/ Units will be normally done by at least two internal examiners concerned with the teaching of the same Modules /Units, subject to the maximum of 30 percent of the entire course-credits (i.e. 100) by any examiner. In an exceptional case, if there is only one or no internal examiner available in a particular theoretical Module the same will be examined by external examiner(s) as

recommended by the PGBoS in Geography, so that the Module is examined by not less than two examiners.

20. Practical Modules in each of the Semesters may be assessed by a Board comprising of both internal and external examiners.

21. There shall be scope of post-publication scrutiny of answer scripts, as per the rules and procedures of the University.

22. Duration of examination for each theoretical Module with 50 marks will be of *two* hours; and normally *four* hours for each of the practical Modules of 50 marks.

23. (A) The students will be required to deliver a seminar lecture on their Dissertation Work related to the Special Paper opted during the Third Semester in presence of the examiners and peers. A panel of examiners comprising of both internal and external shall evaluate the Dissertation (15 marks) and the Presentation (10 marks). The Dissertation should be prepared on a specific Geographical problem by an individual student. It should normally consist of not more than thirty pages of A4 (220×270 mm) size including maps, diagrams, and photographs. The matter should be neatly presented, preferably typed, and duly certified by the supervisor concerned.

    (B) The students, in a group, shall prepare a Field/ Project Report mainly based on primary data under the supervision of a teacher. The Report (15 marks) and Group Discussion/ Field Performance (10 marks) will be evaluated by a Board comprising of both internal and external examiners. The Report should normally consist of not more than thirty pages of A4 (220×270 mm) size including maps, diagrams, and photographs. The matter should be neatly presented, preferably typed, and duly certified by the teacher concerned.

24. There shall be a Board of Moderators for the theoretical papers in each of the Semester examination.

25. The course is structured as per the following details:

Semester	Module	Type	Subject	Marks	Credits
I	101	Th	Philosophy of Geography	50	5
	102	Th	Geomorphology and Geotectonics	50	5
	103	Th	Soil and Biogeography	50	5
	104	Th	Economic Geography	50	5
	105A	Pr	Geospatial Analysis	40	4
	105B	Pr	Term Paper	10	1
II	206	Th	Climatology	50	5
	207	Th	Hydrology and Oceanography	50	5
	208	Th	Population and Regional Development	50	5
	209	Th	Environmental Geography	50	5
	210	Pr	RS, GIS and GPS	50	5
III	311	Th	Historical and Political Geography	50	5
	312	Th	Social and Cultural Geography	50	5
	313	Th	Special Paper – I	50	5
	314	Pr	Statistical Techniques	50	5
	315	Pr	Quantitative and Field Techniques	50	5
IV	416	Th	Research Methodology in Geography	50	5

	417	Th	Regional Geography of India	50	5
	418	Th	Special Paper–II	50	5
	419	Pr	Special Paper–III	50	5
	420A	Pr	Special Paper–IV: Dissertation	25	2.5
	420B	Pr	Field/ Project Report	25	2.5

Note: Total Marks (Credits): Theoretical= 700 (70) and Practical= 300 (30)

26. Grading of Student's Performance will be done in the under-noted manner.

Marks (in percent)	**Numerical Grades**	**Letter Grades**	**Qualitative Grades**	**Class**
75-100	5.50-6.00	O	Outstanding	1st
65-74	4.50-5.49	A+	Good	1st
60-64	4.00-4.49	A	Fair	1st
55-59	3.50-3.99	B+	Satisfactory	2nd
50-54	3.00-3.49	B	Average	2nd
40-49	2.00-2.99	C	Pass	2nd
0-39	0.00-1.99	F	Fail/ Incomplete	X

Marks Range	**Multiplication Factor / marks added to the minimum grade point bracket**
75-100	0.02
65-74	0.11
60-64	0.1225
55-59	0.1225
50-54	0.1225
40-49	0.11
0-39	0.051

Illustration for Computation of Cumulative Grade Point Average (CGPA):

Suppose a student scores 31, 25, 28, 22, and 35 marks in Module 1, 2, 3, 4 and 5 respectively in the 1st Semester, the following will be his/ her Semester Grade Point Average (SGPA). First the marks are to be converted into percentage; in this case these are 62, 50, 56, 44 and 70. Since each Module has 4 Credits the calculation will be as under:

SGPA (for the 1st Semester) = [5 (4.00+0.1225x2)] +[5 (3.00+0.1225x0)] + [5 (3.50+.1225x1)] +[5 (2.00+0.11x4)] + [5 (4.50+0.00x5)]/ 25

= 3.5615 means B+

If, in other three Semesters the SGPA are 5.4590, 4.5635 and 6.45305 then CGPA=∑of four SGPA/ 4 i.e. 5.0092625 =5.01 (A+ or Good)

On the basis of the cumulative results of the student's performance the grades will be given in each Semester as well as over four Semesters.

NB: in the illustration the credits are of equal value which may be different according to weightage in the curricula, and therefore the calculation should take into account the respective credits for the purpose of multiplications.

27. (A) Practical works done by the students will be checked and worksheets will be signed by the concerned teacher(s) on daily-assignment basis, as applicable.
(B) Selection of topics for Term Paper, Field/ Project Work and Dissertation should be made by each student in consultation with his/her supervisor at the beginning of the concerned Semester.
(C) The Head of the Department will keep records and publish an Abstract Volume of Project/ Field Work and Dissertations (in either printed or electronic format) of the topics / problems with an abstract of about 500 words to be submitted by the candidates through their Supervisor.

-SEMESTER I-

MODULE-101: PHILOSOPHY OF GEOGRAPHY (Theoretical–50 marks)

Unit-1: Development in Modern Geographical Thought

1.1 Place of Geography in the classification of knowledge after Varenius and Kant; Evolution of Geography as a spatial science

1.2 Positivism in Geography: Explanation and search for scientific routes

1.3 Critiques of Positivism: Behavioural Geography and Radical Geographies

1.4 Existential phenomenology and Humanistic Geography

Unit- 2: Emergence of Critical Perspectives

2. 1 Crisis of Modernity, Impact of World Wars, and the shift towards critical perspectives

2.2 Post modernity and the production of space after Lefebvre, Harvey and Soja

2.3 Feminist Geography: space, place and identity- concepts and evolution

2.4 Geography of Gender – chronological geographies of Gender

Unit-3: Changing trends and Dimensions

3.1 Geography of inequality

3.2 Colonial and Post-colonial interpretations in Geography

3.3 Geography in the era of globalization: Political-economic perspectives in spatial relations

3.4 New Geographies: Select ideas of Environment and Human Geography- Contesting environment and socializing Nature. New Social Geographies: Clustering and Segregation, Hybrid Geography, Mental Map and Local Imagineries

Unit-4: Contemporary Pedagogies and Research Frontiers in Geography

4.1 Revival of Classical ideas

4.2 Critical appreciation of Darwin's contribution

4.3 Man-environment relations: Revival of Ecological Studies

4.4 Development of Geography in India

MODULE-102: GEOMORPHOLOGY AND GEOTECTONICS (Theoretical–50 marks)

Unit–1: Concepts in Geomorphology

1.1 Spatial scale, temporal scale and related concepts: Systems, feedback, equilibrium and threshold
1.2 Morphogenetic regions; Models of slope evolution
1.3 Measurement and monitoring of landform evolution in fluvial and coastal environments; Significance of process studies and simulation modelling
1.4 Plate tectonics as a unified theory of global tectonics

Unit–2: Rivers and River Basins

2.1 River hydraulics: flow and energy; Hydraulic geometry of streams
2.2 Catchment processes and fluvial processes; Factors regulating entrainment, transportation and deposition of sediments
2.3 Adjustment of channel forms and patterns to morphodynamic variables
2.4 Fluvial landforms: genetic classification, ordering, formation and evolution

Unit–3: Evolution of Landforms

3.1 Coastal morphodynamic variables and their influence on evolution of coastal forms
3.2 Classification and evolution of periglacial landforms
3.3 Impact of Pleistocene on landform evolution
3.4 Planetary geomorphology with special reference to Moon and Mars

Unit–4: Applied Geomorphology

4.1 Application of geomorphology in feasibility assessment of engineering and industrials projects; Geomorphic approach to hazard studies
4.2 Factors, vulnerability, consequences and management of earthquakes, tsunamis and landslides
4.3 Factors, vulnerability, consequences and management of riverbank erosion, storm surges and floods
4.4 Principles of integrated coastal management

MODULE-103: SOIL AND BIOGEOGRAPHY (Theoretical–50 marks)

Unit-1: Soil Geography

1.1 Soil as a component of Biosphere; Concept of land and soil; Plant-water-soil relationship
1.2 Bio-functions of Soil; Soil organic matter, Soil organisms and Micro-organisms and their relation with soil fertility
1.3 Soil mineralogy and Soil nutrients; Role of physico-chemical properties in soil fertility and productivity
1.4 Soil degradation and pollution: causes, processes and consequences; Preventive, ameliorative and conservation measures

Unit-2: Plant Geography

2.1 Plant ecology: habitat factors and plant responses to environment: adaptation, and climax: domestication of plants
2.2 Phyto-geographical regions; Concept of plant species, family and genera; taxonomy
2.3 Consequences of deforestation and exploitation of targeted species; Forest conservation, Social forestry and Participatory Management of Forest
2.4 Concept of degeneration and regeneration of plants

Unit-3: Zoo Geography

3.1 Theory of evolution of species and its critics
3.2 Dispersal of animals in different geological periods
3.3 Dispersal and migration of animals; means and barriers; Zoo-geographical regions of the world
3.4 Principles of animal ecology; Wild life management; Relevance of sanctuaries with special reference to India

Unit-4: Ecosystem and Ecology

4.1 Principles of physical and human ecology; Ecosystem models
4.2 Concepts of biological desert and deep ecology; Forms and functions of forest and marine ecosystems
4.3 International Biological Programme, Man and Biosphere Programme
4.4 Biodiversity conservation with special reference to humid tropics

MODULE-104: ECONOMIC GEOGRAPHY (Theoretical–50 marks)

Unit–1: Resources and Economics

1.1 Location of economic activities and spatial organization of economies; Concept of tertiary and quaternary sectors
1.2 Concept of resource adequacy and scarcity; Ackerman's scheme; Limits to growth: Classical, neo-classical and ecological economics
1.3 Economic systems; Ranking of world economies
1.4 Economic Development theories: Sustainable development, resource and inequality

Unit–2: Agricultural Economy

2.1 Agricultural regions: Concepts and techniques of delineation
2.2 World agricultural systems, Agri-business
2.3 Green revolution and food security in India
2.4 Land tenure systems and land reforms in relation to Indian agriculture

Unit–3: Industrial Economy

3.1 Theories of industrial location as proposed by Palander, Hoover, Smith and Pred
3.2 Spatial distribution of manufacturing industries: Petroleum refining and Textile
3.3 Emerging industries with special reference to Food processing and ICT in India
3.4 Industrial policy of India; Role of liberalisation, privatisation and globalisation in India

Unit–4: Transport, Trade and Commerce

4.1 Transport network analysis and transport models
4.2 Economics of global trade: Balance of payment; Role of GATT, WTO and regional blocks in international trade
4.3 Market network and linkages: Market centres, periodic and daily marketing, retailing and whole-selling, e-commerce
4.4 Labour markets and mobility with special reference to India

MODULE- 105A: GEOSPATIAL ANALYSIS (Practical–40 marks)

Unit- 1: Analyses of topographical maps (12)

1.1 Comparative utility of topomaps, aerial photos and satellite images as sources of geographical data
1.2 Preparation of block diagram, long and cross profiles, hypsometric curves; Stream ordering after Horton and Strahler; Preparation of maps depicting drainage density and stream frequency; Identification of geomorphic features
1.3 Preparation of maps showing hierarchy of settlements, connectivity index and detour index, Nearest Neighbour Analysis (NNA)
1.4 Interpretation of maps and diagrams

Unit-2: Interpretation of Aerial Photos (10)

2.1 Basic concepts of aerial photography
2.2 Determination of scale, point transfer; Delineation of overlapping and effective area
2.3 Identification of physical and cultural features
2.4 Preparation of maps and interpretation

Unit-3: Analyses of satellite images (10)

3.1 Common types of IRS and Landsat sensors and their suitability for analysis of geographical information; Indian referencing scheme of IRS sensors
3.2 Extraction of physical features from satellite images of various resolution and band combinations.
3.3 Extraction of cultural features from satellite images of various resolution and band combinations.
3.4 Detection of change from multi-dated maps and/or images

Unit-3: Laboratory Note Book and Viva Voce (4+4)

MODULE-105B: TERM PAPER (Practical–10 marks)

The Term Paper should be hand-written within 10 A4 pages. It will be assessed internally.

-SEMESTER II-

MODULE-206: CLIMATOLOGY (Theoretical–50 marks)

Unit–1: Concepts of Weather and Climate

1.1 The climate system: Micro, Meso and Macro; Linkages of climate with other environmental systems
1.2 Role of heat and moisture in the atmosphere; Adiabatic processes and instabilities
1.3 The wind circulation systems: Primary, Secondary and Tertiary
1.4 Clouds: Formation and classification; Precipitation: Forms and functions

Unit–2: Tropical Climates and Weather Hazards

2.1 Tropical circulations: Hadley and Walker, ENSO phenomena
2.2 Tropical air mass; Convergence and divergence
2.3 The Asian Monsoon: Importance, characteristics, and prediction
2.4 Weather hazards – Heat and cold waves, thunderstorm, tornado and cyclone: Distribution, significance and forecasting.

Unit–3: Climate Change

3.1 Scientific evidences of climate change; Reconstruction of past climates
3.2 Theories of climate change; Prognostication of future climates
3.3 The climate cycle; Climate trends in the Holocene period
3.4 Recent trends of global climates: Implications and arguments

Unit–4: Applied Climatology

4.1 Approaches and techniques of weather forecasting with reference to the tropics: short, medium and long range
4.2 Climate and agriculture: Agro-climatology – Water budget and Crop Calendar
4.3 Climate and settlements: Urban climatology – Urban Heat Island and Architecture
4.4 Climate and health: Bio-climatology – Human Comfort and morbidity

MODULE-207: HYDROLOGY AND OCEANOGRAPHY (Theoretical–50 marks)

Unit–1: Hydrology - I

1.1 Water in earth: forms, occurrences and properties
1.2 Significance of the global hydrological cycle with special reference to global storage and transportation of heat
1.3 Precipitation, evaporation and transpiration in different landuse/landcover conditions. Modern methods of recording these attributes
1.4 Hydrological data: Source, measurement and analysis

Unit–2: Hydrology - II

2.1 Water management in tropical farmlands: Techniques and approaches. Artificial rainmaking
2.2 Water management in tropical cities: Techniques and approaches. Rainwater harvesting
2.3 Principles of integrated basin management with reference to micro-watershed planning
2.4 Consequences of river impoundment; Issues related to damming of large rivers

Unit–3: Oceanography - I

3.1 Classification, characteristics and origin of the major structural and morphological features of the ocean floor with particular reference to plate tectonics
3.2 Bottom topography of Indian Ocean: characteristics and evolution
3.3 Waves and tides: Genetic classification and models of formation
3.4 Ocean circulation: classification and significance

Unit–4: Oceanography - II

4.1 Water mass: origin, evolution, physical and chemical properties. Air-sea interactions
4.2 Sea-level change: types, causes and implications
4.3 Ocean as a resource: Anthropogenic utilisation of the oceans
4.4 EEZ and CRZ: delimitation, significance and policy issues

MODULE-208: POPULATION AND REGIONAL DEVELOPMENT (Theoretical–50 marks)

Unit-1: Population Geography

1.1. Changing approaches to Population Geography- - Contemporary trends

1.2. Population- Demographic characteristics- reproduction, health and education- Challenges for developed and developing countries

1.3. Critical review of population growth theories and models – demographic transition and demographic dividend- critic

1.4. Population Quality: Literacy, Occupation and Health; Population Composition

Unit-2: Migration, Mobility and Displacement

2.1. Factors, processes and typology – Contemporary trends in developed and developing countries - Rural and urban dimensions
2.2. Population, social organisation and governance -People as communities and citizens - People's rights in contemporary societies; enclaves and their problems
2.3. Population as social capital- Status of developed and developing countries
2.4. Population and Vulnerability: Displacement – Diaspora and Identity Crisis

Unit- 3: Theories of Regional Development
3.1. Concepts: Growth and Development, spatial integration, factors affecting regional development
3.2. Classical and Neoclassical Growth models: Smith, Keynes, Rostow, Marx
3.3. Models of industrialisation-urbanisation: Perroux, North, Myrdal, Hirschman, Friedmann
3.4. Alternative models: Agropolitan, Basic Needs, Export-led, Import Substitution

Unit-4: Global Economic Integration and Regional Development
4.1. Understanding Dependency: Frank, Santos; Neo-Liberal influences
4.2. Convergence-Divergence, scales of economies and their relation with regional development.
4.3. Role of Institutions in Regional Development: framework and actors
4.4. Regional Development: paradigm shifts and regional disparity in India

MODULE-209: ENVIRONMENTAL GEOGRAPHY (Theoretical–50 marks)

Unit–1: Concepts

1.2 Geographers' approach to environmental studies; Significance of environmental perception
1.2 Physical Components: Lithosphere, Hydrosphere, Atmosphere, Biosphere and their relationship
1.3 Socio-cultural components with special reference to Demographic characteristics, Health and Nutrition, Income and Education, Housing and Sanitation
1.4 Concept of Holistic Environment and emergence of Environmentalism

Unit–2: Environmental Hazards, Pollution and Technology

2.1 Perception of Degradation, Pollution, Hazards and Disaster
2.2 Natural hazards: Vulnerability and risk; Social response, hazard reduction and disaster management
2.3 Social hazards: Poverty, disease and crime- Responsible factors, impact and redressal
2.4 Pollution of air, water and soil: Sources, management, health impact and control measures; Role of brown and green technology in the context of energy base for vehicular movement and industrialization

Unit–3: Global Environmental Issues

3.1 Global resource crisis and population equilibrium
3.2 History of Earth Summits and significance of Sustainable Development
3.3 Relevance of Montreal and Kyoto Protocols
3.4 Biodiversity conservation and genetically modified organisms (GMOs)

Unit–4: Environmental Issues in India

3.1 Big dams and their viable alternatives
3.2 Conservation of wetland and wasteland management
3.3 Forest policies in India and problems of forest- society interface
3.4 Urban- industrial expansion and social conflict

MODULE-210: RS GIS AND GNSS (Practical–50 marks)

Unit- 1: Remote Sensing

1.1 Georeferencing using ortho-images and GNSS data
1.2 Generation of spectral library of LU/LC features from L3 and TM data
1.3 Image classification
1.4 Change detection from multidated maps and images

Unit-2: Geographical Information System

2.1 Raster to vector conversion
2.2 Spatial analysis through vector overlay
2.3 Preparation of annotated thematic maps
2.4 Preparation of DEM from spot heights, contours and SRTM data

Unit-3: Global Navigation Satellite System

3.1 Principles of GNSS positioning with special reference to GPS
3.2 Collection and retrieval of GNSS positions
3.2 Preparation of maps from GNSS data
3.3 Length and area measurements from GNSS data

Unit-4: Laboratory Note Book and Viva Voce