Structure and Detailed Syllabus
of the Postgraduate Course (M.Sc.) in Geography
Department of Geography
Presidency University

Department of Geography
(Faculty of Natural Sciences and Mathematics),
Presidency University,
Hindoo College (1817-1855), Presidency College (1855-2010)
86/1, College Street, Kolkata - 700 073
West Bengal, India
# Content

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Semester-wise Course Structure and Module Compositions</strong></td>
<td>2 - 4</td>
</tr>
<tr>
<td>Geotectonics and Geomorphology</td>
<td>5</td>
</tr>
<tr>
<td>Social Geography and Population Geography</td>
<td>7</td>
</tr>
<tr>
<td>Environment and Landscape</td>
<td>9</td>
</tr>
<tr>
<td>Research Methodology and Survey Techniques</td>
<td>10</td>
</tr>
<tr>
<td>Approaches to Modelling and Qualitative Data Analysis</td>
<td>11</td>
</tr>
<tr>
<td>Climatology and Oceanography</td>
<td>12</td>
</tr>
<tr>
<td>Regional Planning and Geography of Trade and Transport</td>
<td>14</td>
</tr>
<tr>
<td>Philosophy of Geography and Geopolitical Issues</td>
<td>16</td>
</tr>
<tr>
<td>Advanced Analytical Techniques</td>
<td>18</td>
</tr>
<tr>
<td>Advanced Geoinformatics</td>
<td>19</td>
</tr>
<tr>
<td>Geo-environmental Issues (Elective Stream I: Core Physical Geography)</td>
<td>21</td>
</tr>
<tr>
<td>Contemporary Social Issues in India (Elective Stream II: Core Human Geography)</td>
<td>22</td>
</tr>
<tr>
<td>Streamflow Behaviour and Morphology (Elective Stream I: Option A - River Science)</td>
<td>23</td>
</tr>
<tr>
<td>Geomorphology and Hydrology of Landscapes (Elective Stream I: Option B - Physical Basis of Landscape Management)</td>
<td>25</td>
</tr>
<tr>
<td>Concepts and Theories of Regional Development and Urbanisation (Elective Stream II: Option A - Regional Development and Urban Studies)</td>
<td>27</td>
</tr>
<tr>
<td>Geographies of Tourism and Development Issues (Elective Stream II: Option B - Geographies of Development)</td>
<td>29</td>
</tr>
<tr>
<td>Techniques in Environmental Geography (Elective Stream I: Core Physical Geography)</td>
<td>31</td>
</tr>
<tr>
<td>Techniques in Human Geography (Elective Stream II: Core Human Geography)</td>
<td>32</td>
</tr>
<tr>
<td>Techniques in River Science (Elective Stream I: Option A - River Science)</td>
<td>33</td>
</tr>
<tr>
<td>Techniques in Physical Landscape Analysis and Management (Elective Stream I: Option B - Physical Basis of Landscape Management)</td>
<td>34</td>
</tr>
<tr>
<td>Techniques in Regional and Urban Analysis (Elective Stream II: Option A - Regional Development and Urban Studies)</td>
<td>35</td>
</tr>
<tr>
<td>Methods in Developmental Geographies (Elective Stream II: Option B - Geographies of Development)</td>
<td>36</td>
</tr>
<tr>
<td>Dissertation Methods</td>
<td>37</td>
</tr>
<tr>
<td>Regional Geomorphic Entities (Elective Stream I: Core Physical Geography)</td>
<td>38</td>
</tr>
<tr>
<td>Geography of Development and Political Economy (Elective Stream II: Core Human Geography)</td>
<td>40</td>
</tr>
<tr>
<td>Sediment in the Fluvial System (Special Paper for Elective Stream I: Option A - River Science)</td>
<td>42</td>
</tr>
<tr>
<td>Assessing Landscape and Water Quality (Special Paper for Elective Stream I: Option B - Physical Basis of Landscape Management)</td>
<td>43</td>
</tr>
<tr>
<td>Sustainable Urban Development (Special Paper for Elective Stream II: Option A - Regional Development and Urban Studies)</td>
<td>45</td>
</tr>
<tr>
<td>Social Well-Being and Community Development with special reference to India (Elective Stream II: Option B - Geographies of Development)</td>
<td>47</td>
</tr>
<tr>
<td>Riverine Landscape Components and Management (Special Paper for Elective Stream I: Option A - River Science)</td>
<td>49</td>
</tr>
<tr>
<td>Integrated Landscape and Water Management (Special Paper for Elective Stream I: Option B - Physical Basis of Landscape Management)</td>
<td>51</td>
</tr>
<tr>
<td>Urban Governance, Infrastructure and Development (Elective Stream II: Option A - Regional Development and Urban Studies)</td>
<td>53</td>
</tr>
<tr>
<td>Agricultural Geography (Special Paper for Elective Stream II: Option B - Geographies of Tourism and Development Issues)</td>
<td>55</td>
</tr>
<tr>
<td>Fieldwork Project</td>
<td>57</td>
</tr>
<tr>
<td>Dissertation Project</td>
<td>58</td>
</tr>
</tbody>
</table>
Semester-wise Course Structure and Module Composition

<table>
<thead>
<tr>
<th>Semester</th>
<th>Papers</th>
<th>No. of Modules</th>
<th>Credit</th>
<th>Marks</th>
<th>Total Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester - I</td>
<td>Theory</td>
<td>3</td>
<td>12</td>
<td>150</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>Practical</td>
<td>2</td>
<td>8</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Semester - II</td>
<td>Theory</td>
<td>3</td>
<td>12</td>
<td>150</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>Practical</td>
<td>2</td>
<td>8</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Semester - III</td>
<td>Theory</td>
<td>2</td>
<td>8</td>
<td>100</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>Practical</td>
<td>3</td>
<td>12</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Semester - IV</td>
<td>Theory</td>
<td>3</td>
<td>12</td>
<td>150</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>Practical</td>
<td>2</td>
<td>8</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Theory</td>
<td>11</td>
<td>44</td>
<td>550</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>Practical</td>
<td>9</td>
<td>36</td>
<td>450</td>
<td></td>
</tr>
</tbody>
</table>

Course Credits denote the number of teaching hours allocated to the Module / week during the course of the Semester

**Academic Session**: Each Semester shall contain at least 16 Teaching Weeks

Odd Semesters: Semesters One and Three - July to December; Even Semesters: Semesters Two and Four - January to June
### Semester: First  
**Year: First**

<table>
<thead>
<tr>
<th>Paper Type</th>
<th>Paper Name</th>
<th>Paper Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td>Geotectonics and Geomorphology</td>
<td>GEOG 0701</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Social Geography and Population Geography</td>
<td>GEOG 0702</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Environment and Landscape</td>
<td>GEOG 0703</td>
<td>4</td>
</tr>
<tr>
<td>Practical</td>
<td>Research Methodology and Survey Techniques</td>
<td>GEOG 0791</td>
<td>4</td>
</tr>
<tr>
<td>Practical</td>
<td>Approaches to Modelling and Qualitative Data Analysis</td>
<td>GEOG 0792</td>
<td>4</td>
</tr>
</tbody>
</table>

### Semester: Second  
**Year: First**

<table>
<thead>
<tr>
<th>Paper Type</th>
<th>Paper Name</th>
<th>Paper Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td>Climatology and Oceanography</td>
<td>GEOG 0801</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Regional Planning and Geography of Trade and Transport</td>
<td>GEOG 0802</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Philosophy of Geography and Geopolitical Issues</td>
<td>GEOG 0803</td>
<td>4</td>
</tr>
<tr>
<td>Practical</td>
<td>Advanced Analytical Techniques</td>
<td>GEOG 0891</td>
<td>4</td>
</tr>
<tr>
<td>Practical</td>
<td>Advanced Geoinformatics</td>
<td>GEOG 0892</td>
<td>4</td>
</tr>
</tbody>
</table>

### Semester: Third  
**Year: Second**

<table>
<thead>
<tr>
<th>Paper Type</th>
<th>Paper Name</th>
<th>Paper Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td>Geo-environmental Issues</td>
<td>GEOG 0901A</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Contemporary Social Issues in India</td>
<td>GEOG 0901B</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Streamflow Behaviour and Morphology (Special Paper for Elective Stream I: Core River Science)</td>
<td>GEOG 0902A1</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Geomorphology and Hydrology of Landscapes (Special Paper for Elective Stream I: Option A - Physical Basis of Landscape Management)</td>
<td>GEOG 0902A2</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Concepts and Theories of Regional Development and Urbanisation</td>
<td>GEOG 0902B1</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Geographies of Tourism and Development Issues (Special Paper for Elective Stream II: Option B - Geographies of Development)</td>
<td>GEOG 0902B2</td>
<td>4</td>
</tr>
<tr>
<td>Practical</td>
<td>Techniques in Environmental Geography (Elective Stream I: Core Physical Geography)</td>
<td>GEOG 0991A</td>
<td>4</td>
</tr>
<tr>
<td>Practical</td>
<td>Techniques in Human Geography (Elective Stream II: Core Human Geography)</td>
<td>GEOG 0991B</td>
<td>4</td>
</tr>
<tr>
<td>Practical</td>
<td>Techniques in River Science (Special Paper for Elective Stream I: Option A - River Science)</td>
<td>GEOG 0992A1</td>
<td>4</td>
</tr>
<tr>
<td>Practical</td>
<td>Techniques in Physical Landscape Analysis and Management</td>
<td>GEOG 0992A2</td>
<td>4</td>
</tr>
<tr>
<td>Practical</td>
<td>Techniques in Regional and Urban Analysis                              (Special Paper for Elective Stream II: Option A - Regional Development and Urban Studies)</td>
<td>GEOG 0992B1</td>
<td>4</td>
</tr>
<tr>
<td>Practical</td>
<td>Methods in Development Geographies (Special Paper for Elective Stream II: Option B - Geographies of Development)</td>
<td>GEOG 0992B2</td>
<td>4</td>
</tr>
<tr>
<td>Dissertation</td>
<td>Dissertation Methods</td>
<td>GEOG 0993</td>
<td>4</td>
</tr>
</tbody>
</table>

### Semester: Fourth  
**Year: Second**

<table>
<thead>
<tr>
<th>Paper Type</th>
<th>Paper Name</th>
<th>Paper Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td>Regional Geomorphic Entities (Elective Stream I: Core Physical Geography)</td>
<td>GEOG 1001A</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Geography of Development and Political Economy (Elective Stream II: Core Human Geography)</td>
<td>GEOG 1001B</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Sediment in the Fluvial System (Special Paper for Elective Stream I: Option A - River Science)</td>
<td>GEOG 1002A1</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Assessing Landscape and Water Quality (Special Paper for Elective Stream I: Option B - Physical Basis of Landscape Management)</td>
<td>GEOG 1002A2</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Sustainable Urban Development (Special Paper for Elective Stream II: Option A - Regional Development and Urban Studies)</td>
<td>GEOG 1002B1</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Social Well-Being and Community Development with special reference to India</td>
<td>GEOG 1002B2</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Riverine Landscape Components and Management</td>
<td>GEOG 1003A1</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Integrated Landscape and Water Management</td>
<td>GEOG 1003A2</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Urban Governance, Infrastructure and Development</td>
<td>GEOG 1003B1</td>
<td>4</td>
</tr>
<tr>
<td>Theory</td>
<td>Agricultural Geography</td>
<td>GEOG 1003B2</td>
<td>4</td>
</tr>
<tr>
<td>Practical</td>
<td>Fieldwork Project</td>
<td>GEOG 1091</td>
<td>4</td>
</tr>
<tr>
<td>Dissertation</td>
<td>Dissertation Project</td>
<td>GEOG 1092</td>
<td>4</td>
</tr>
</tbody>
</table>
DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for First Semester of the Postgraduate Course in Geography

Module Name: Geotectonics and Geomorphology

Paper Type: Theory

Paper Code: GEG 0701

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Geotectonics and Landforms

1.1 Global Topography and Hypsometry [1]
1.2 Tectonic and Structural Landforms: Hierarchies and Varieties; Case studies of significant geologic provinces and plate margins [3]
1.3 Triple-Plate Junctions: Types and Stability, Plate Geometry and Movements, Surface Expressions [3]
1.4 Tectonic Geomorphology: Principles, Geomorphic Markers, Rates of Uplift and Erosion, Isostatic Relations [3]
1.5 Neotectonics and Landscape response: Active tectonics and riverine and coastal systems; Sedimentation and Tectonics [3]
1.6 Linkages between Climate Change and Tectonics; Idea of Snowball Earth [3]

Unit II: Geomorphology: Concepts and Processes

2.1 Spatial and temporal scales in geomorphological studies; Present research frontiers and Geomorphology in the Anthrhopocene [3]
2.2 Field and Laboratory experiments in Geomorphology: Design, relevance and scaling [2]
2.4 River metamorphosis: Concepts and mechanisms; Geomorphology of large floods [3]
2.5 Geochronology: Concepts; Absolute and Relative Dating of Landscapes and Events; Ascertaining landscape evolutionary histories [4]

Unit III: Geomorphological Regions and Regimes

3.1 Mountain Geomorphology: Mountain System evolution and rates of erosion, Mass movements and GLOFs, Himalayan case studies [3]
3.2 Proglacial and Paraglacial Landscapes: Denudation processes and landforms [3]
3.4 Global erosion rates, sediment yields, regime and morphologies of Tropical Rivers; Brahmaputra and Subarnarekha case studies [3]
3.5 Sediment fluxes in coastal environments and estuaries; Beach morphology; Bioturbation, bio-tidal accretion, storm surge effects [3]

Unit IV: Applied Geomorphology

4.1 Applied Geomorphology: Principles and Purpose; Anthropogenic Geomorphology: Processes, landforms and land transformations [2]
4.2 Geoinformatics in Geomorphology: Utility of satellite images, Digital Elevation Models and advanced surveying methods [3]
4.3 Principles of River Restoration: Hard and Soft Techniques; Riparian quality and stream health evaluation [3]
4.4 Habitat Dynamics in lotic ecosystems: Rapid Habitat Assessment Methods; Understanding Stress, Habitat Gain/Loss and Extents [3]
4.5 Geomorphological processes in urban environments: runoff and channelisation concepts, geotechnical engineering principles [3]
Suggested Readings:

17. Gregory K.J., Goudie A.S. (eds.) (2011); *The SAGE Handbook of Geomorphology*
Module Name: Social Geography and Population Geography

Paper Type: Theory

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Elements of Indian Society
1.1 Concept of Caste, Class and Race in India
   - Depiction in the Ancient Texts of India - Varna and Jati - Patron Client Relationship, Caste in Colonial Period, Post Independent Caste Identity, Scheduled Caste and Backward Caste, Spatial Distribution of various castes in India [6]
   - Concept of Class, Race and Ethnicity [2]

1.2 Religion and Tribal Identity
   - Concept of Religion - major religions of the World and India, minority population and issues of communalism [4]
   - Tribes concept, spatial distribution in India, Society and cultural identity [4]

Unit II: Geography of Social Space: Indian Context
2.1 Social disintegration and spatial segmentation in India - examples from rural and urban areas [4]
2.2 Social problems in India - Social exclusion, backwardness and deprivation of SC, ST Population [6]
2.3 Socio-spatial inequality in Education and Health [6]

Unit III: Mortality, Morbidity, Public Health
3.1 Need and importance of the study of Morbidity and Mortality; Direct and indirect techniques of standardization of mortality rates [4]
3.2 Conventional measures of infant mortality (IMR) and its sub-divisions- Neo-natal (early and late) and post-Neonatal mortality [4]
3.3 Measures of morbidity; incidence and prevalence rates; Interrelationships between measures of morbidity; Importance of Infant mortality in population and health; [6]
3.4 Basic concept of a life table; Brief history of life tables: Anatomy of life table; Types and forms of life tables; Application of life table in demographic analysis [4]

Unit IV: Population in India
4.1 Ageing of population; Occupational structure; Determinants of workforce; Types of workers [4]
4.2 Impact of migration on population change and economy of source area and destination [2]
Suggested Readings: Social Geography


Suggested Readings: Population Geography

Module Name: Environment and Landscape

Paper Type: Theory

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Figures in [ ] indicate number of credit hours allocated for the topic

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern: Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Environmental Issues in Geography

1.1 Man - Land relationships; Ecological balance; Restoring damaged ecosystems [6]
1.2 Social Vulnerability and Environmental Change [6]
1.3 Alternative views on Climate Change [4]
1.4 Big dams versus small dams [4]
1.5 International and Inter-State Water Dispute in Indian subcontinent [6]
1.6 Municipal Solid Waste: Disposal Recovery and Management [6]

Unit II:

Suggested Readings: Environment and Landscape

Module Name: Research Methodology and Survey Techniques

Paper Type: Practical

Total Marks: 50

Credit: 6 Credit Hours / week (6 x 16 teaching weeks = 96 credit hours per semester)

Figures in [ ] indicate number of credit hours allocated to that particular topic per teaching week

Module Evaluation: Continuous Evaluation throughout the Semester

Unit I: Fundamentals of Research

1.1 Nature of Science- description, causality, prediction and explanation; Nature of natural and behavioural systems; Nature of Geographical enquiries- Physical and Human; Deterministic and non-deterministic approaches

1.2 Theorizing our World- ontology, epistemology, research paradigms, methods and methodology; Types of logical reasoning- Inductive, Deductive and Abductive

1.3 Nature and objectives of research; Research Types: descriptive-analytical, pure-applied, conceptual-empirical, qualitative-quantitative

Unit II: Research Process

2.1 Steps in Research process

2.2 Needs and objectives of Literature Review; Conducting literature survey- searching literature, reviewing selected literature, developing theoretical and conceptual frameworks, Reporting literature review; Citation methods- foot note, text note, end note, bibliography and citation rules

2.3 Research Problems- meaning, importance and sources; selecting, defining, stating and evaluating a research problem; Selection of research objectives; Exercises on writing introduction of a research article

2.4 Hypothesis: Definition, sources, roles and types of hypothesis; Tests of hypothesis; Errors in testing hypothesis

2.5 Research Strategies: Case studies, Experiments, Ethnography, Phenomenology, Grounded Theory, Action Research

2.6 Data Collection Methods: Questionnaire, Interview, Focus Group, Participant Observation; Sampling- Concept, principles, factors affecting inferences drawn from a sample; Types of sampling- non-random/non-probability sampling designs, systematic sampling; Sample size calculation

Unit III: Reading a Scientific Research Paper

3.1 Introduction Section: Background, Hypothesis/Research Question, Premise, Logic, Novelty

3.2 Material and Method Section: Research Design, Data/Materials used, Sampling Strategy, Techniques used

3.3 Result Section: Coherence, Reliability and validity of data; Important observations

3.4 Discussion Section: Interpretation of results and main conclusions

Unit IV: Surveying Methods

4.1 Fundamentals of TS survey and Terrain Mapping with DEM Generation

4.2 DGPS Survey techniques

Suggested Readings: Research Methodology and Survey Techniques


Module Name: Approaches to Modelling and Qualitative Data Analysis

Paper Type: Practical

Total Marks: 50

Credit: 6 Credit Hours / week (6 x 16 teaching weeks = 96 credit hours per semester)  
Figures in [ ] indicate number of credit hours allocated to that particular topic per teaching week

Module Evaluation: Continuous Evaluation throughout the Semester

Unit I: Fundamentals of Models and Modelling

1.1 Concept of model: Nature of environmental systems; Types of model [4]
1.2 Purpose of modelling; Model structure and formulation [5]
1.3 Describing problems with mathematical formalism [7]
1.5 Model parameterization and calibration; Model evaluation methods - Graphical analysis, Quantitative analysis of accuracy, Sensitivity analysis, Uncertainty analysis [7]
1.6 Case Studies of environmental models: Soil and Hydrology - experimental models, Erosion and transport models [8]

Unit II: Modelling Temporal Data

2.1 Analysis of Temporal Data: Markov Chains - Concept, transitions frequency matrix, transition probability matrix, testing the transition frequency matrix [6]
2.2 Series of events: Testing for randomness, trend, uniformity and pattern [4]
2.3 Noise reduction: Smoothing, windows and filters [4]
2.4 Detection of Cycles: Autocorrelation; Fourier Analysis [6]
2.5 Principles of ARIMA modelling [7]

Unit III: Handling Qualitative Data

3.1 Designing a project for qualitative data analysis using a qualitative analytic software [6]
3.2 Creating documents and document attributes for qualitative analysis [6]
3.3 Setting up a coding system and coding text for qualitative analysis [8]
3.4 Modelling the conceptual framework using qualitative analytic software [8]

Suggested Readings: Approaches to Modelling and Qualitative Analysis

Module Name: Climatology and Oceanography

Paper Type: Theory

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation:

Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Atmospheric Thermodynamics and Dynamics

1.2 Adiabatic Processes, Equations of state of moist air and latent heat [2]
1.3 Hydrostatic equilibrium: Hydrostatic equation, variation of pressure with height, geopotential; Hydrodynamic stability [2]
1.4 Entropy and Second Law of Thermodynamics, Carnot Cycle and Clausius-Clapeyron equation [2]
1.5 Electrical fields in Thunderstorms, Theories of Thunderstorm Electrification [2]
1.6 Basic equations and fundamental forces: Pressure, Gravity, Centripetal and Coriolis forces, Continuity Scale Analysis, Inertia Flow, Geostrophic and Gradient Winds, Thermal Wind, Divergence and Vertical Motion; Rossby, Richardson, Reynold and Froude Numbers; Circulation, Vorticity and Divergence [6]

Unit II: Monsoon Climatology and Climate Change

2.1 Genesis of Indian Monsoon and the causes of its variability [3]
2.2 Classification, sources, origin and modifications of air masses [4]
2.3 Urban Microclimate with special reference to tropical cities [3]
2.4 Global Climate Change: Climatic records; Evidences of past climatic changes; Causes - Natural and Anthropogenic; Feedback mechanism; Possible impacts; Reaction, prevention, mitigation and adaptations [4]
2.5 Forecast of local weather [2]

Unit III: Physical Oceanography

3.2 Upper Ocean Structure and Processes [4]
3.3 Evolution of Ocean Floor Morphostructure - Actualistic Model [4]
3.4 Vorticity, Deep Ocean Circulation and Ocean Waves [4]
3.5 Tides - generating forces, types, theories and effects [4]

Unit IV: Marine Resources and Coastal Management

4.1 Pelagic and Benthic Communities of the Ocean [4]
4.2 Marine Resources - types, extraction methods and economic significance [4]
DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Suggested Readings: Climatology

Suggested Readings: Oceanography
7. Pinet, P.R. (2009): Invitation to Oceanography, Jones and Bartlett Publishers, Sudbury, Massachusetts
Module Name: Regional Planning and Geography of Trade and Transport

Paper Type: Theory

Paper Code: GEOG 0802

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation:

Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Concept of Region

1.1 Approaches to regional studies: ecological, economic and socio-cultural [2]

1.2 Regional hierarchy (micro, meso and macro); region of isolation; backward region [2]


1.4 Techniques in regional analysis: Regional Multiplier; Input-output, export based model [3]

Unit II: Planning in India

2.1 Centralized and Decentralized Regional Planning Process; Process of planning in West Bengal [3]

2.2 Neoclassical convergence theory. Role of New Economic Policies on regional inequality in India [4]

2.3 Economic issues of rural development: Differentiating economic growth and economic development, rural jobs and income sources [4]

2.4 Metropolitan region: concept of city region and delineation techniques, Case Study of NCR [4]

2.5 Concept of balanced and unbalanced growth, Location of new regional economic activities [4]

Unit III: Geography of Trade and Transport

3.1 Transportation Geography and its significance [2]

3.2 Environment and transport: positive and negative dimensions [2]

3.3 Transport Network Analysis: Topology, Graph Theory [4]

3.4 Accessibility and Connectivity- Network and nodal connectivity, Inter regional and Intra regional [4]

3.5 Models of transport: Spatial interaction model, Traffic analysis and congestion model; Modes of transport and Comparative cost advantages [8]

3.6 Urban land use transport models, Urban transport problems [4]

3.7 GATT, WTO and TRIPS [4]

3.8 World Economic Blocs and Global Conflict on Energy Resources [4]
Suggested Readings: *Regional Planning and Geography of Trade and Transport*

10. Regional Imbalances and Role of Planning in India (http://www.jrdp.in/currentissue/2_2_persp.pdf)
DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for Second Semester of the Postgraduate Course in Geography

Module Name: Philosophy of Geography and Geopolitical Issues

Paper Type: Theory

Paper Code: GEOG 0803

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Figures in [ ] indicate number of credit hours allocated for the topic

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern: Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Philosophy of Geography

1.1 Geography of Inequality and Social Justice: Social Inequality, Social Justice, and Territorial Justice [4]


1.3 Geography of Gender: Feminist Movement, Gender and organization of Geographical space, Patriarchy, Public vs Private space; Different Geographical Traditions: Radical Feminist, Social Feminist, Eco-Feminism [6]

1.4 Marxist Geography: Marxist world view of society and economy, Geography after Marx: David Harvey and others; Historical-Geographical Materialism, Production of Space, and Uneven Development [6]

1.5 Colonialism, Imperialism and Geography, Post-colonialism and Postcolonial theory, Post-colonialism in geography [6]


Unit II: Geopolitical Issues

2.1 Background of Geopolitics: Geopolitical Theories (Views of Ratzel, Mackinder, Spykeman, Mahan); Tools of Geopolitics (Maps, Propaganda, Perception and Strategy) [6]

2.2 Emergence of Geopolitical World Order: Demands of Nation States and First World War; Colonialism and British Geopolitics; German Geopolitics and Expansionism; Naval Politics of Japan and Second World War [8]

2.3 Cold and Post Cold War-Contemporary Geopolitics: Warsaw Pact- Soviet Communistic Rule and its Destruction; American Supremacy and Emergence of Unipolar World; Emergence of Chinese Market Socialism; Neo Left and Geopolitical Conflicts in Latin America [8]

2.4 Geopolitics of India and the World: Geopolitics of Insurgency and Terrorism; Global Political and Economic Blocks; India's Relationships with Neighbours; Global Power: India's Aspiration and Challenges [10]
Suggested Readings: Philosophy of Geography and Geopolitical Issues

32. Klaus Dodds, Geopolitics: A Very Short Introduction (Oxford University Press, 2014)
35. Max Boot, Invisible Armies: An Epic History of Guerilla Warfare from Ancient Times to the Present (Liveright, 2013)
37. Paul Virilio, Open Sky (Verso, 2008)
40. Saul Bernard Cohen, Geopolitics: The Geography of International Relations (Rowman & Littlefield, 2009)
43. Stuart Elden, Terror and Territory: The Spatial Extent of Sovereignty (University of Minnesota Press, 2009)
Module Name: Advanced Analytical Techniques

Paper Type: Practical  
Paper Code: GEOG 0891

Total Marks: 50

Credit: 6 Credit Hours / week (6 x 16 teaching weeks = 96 credit hours per semester)

Figures in [ ] indicate number of credit hours allocated to that particular topic per teaching week

Module Evaluation: Continuous Evaluation throughout the Semester

Unit I: Multivariate Data Analysis

1.1 Examining Data: Graphical examination; Missing Data; Outliers; Testing assumptions; Incorporating dummy variables [4]
1.2 Multiple Linear Regression; Multiple and partial Correlation coefficients; Stepwise regression; Path Analysis [10]
1.3 Eigenvector Methods: Principal Component Analysis, Factor Analysis [10]
1.4 Interdependence Techniques: Cluster Analysis, Multidimensional Scaling [10]
1.5 Classification of Multivariate Data: Statistical and Econometric Techniques - Multiple Discriminant Analysis, Logit and Probit analysis; Non-parametric Techniques - Neural Network Analysis; Parametric Techniques - Analytical Hierarchical Process [12]
1.6 Structural Equation Modelling [4]

Unit II: Spatial Statistics

2.1 Visualization of Spatial Data: Maps for point and areal features [4]
2.2 Trend Surface Analysis - First order [4]
2.3 Spatial Smoothing Techniques: Locally weighted averages, Non-parametric regression, Empirical Bayes smoothing, Splines, Probability mapping [8]
2.4 Surface Estimation - Spatial Autocorrelation (Computation of Moran's I and Geary's S), Triangulation, Inverse Distance Averaging, 3D splines, Krigging and Variograms, Analysis of Fractal Dimension [12]

Unit III: Point Pattern Analysis

3.1 Density-based Point Pattern Measures: Quadat Count Method; Kernel Density Estimation (K means) [6]
3.2 Distance-based Point Pattern Measures: Nearest Neighbour Distance; G function; F function; K function; Pair Correlation Function [8]
3.3 Assumption of Point Pattern - Monte Carlo Procedure [4]

Suggested Readings: Advanced Analytical Techniques

Module Name: Advanced Geoinformatics

Paper Type: Practical

Total Marks: 50

Credit: 6 Credit Hours / week (6 x 16 teaching weeks = 96 credit hours per semester)

Figures in [ ] indicate number of credit hours allocated to that particular topic per teaching week

Module Evaluation: Continuous Evaluation throughout the Semester

Unit I: GNSS and GIS

1.1 Different GNSS Systems in Operation; How a GNSS system works; Sources of error in a GNSS system [4]
1.2 Mapping exercise with hand-held GPS, data downloading and visualization, import GPS data in GoogleEarth [6]
1.3 Introduction to GIS: Concepts of Projection, datum and spheroid, mean sea level, orthometric height, geoid models; Formats of storing GIS Data [4]
1.4 Georeferencing a raster layer with GPS Points and an existing georeferenced layer, defining projection, re-project from one projection to another [4]
1.5 Creating Vector layers through on-screen digitisation- Point, Line, Polygon [6]
1.6 Creating Attribute Table: Add Fields for different data types, Joining and relating tables, Simple query building [4]
1.7 Raster data manipulation: Resampling, Mathematical operations using raster layers [4]
1.8 Case Studies: Forest Planning for Sensitive Wildlife Species, Population mapping and modelling, Impact of Sea Level Rise and Storms on Cities, Delineation of Watersheds (any two) [16]

Unit II: Remote Sensing and Aerial Photo

2.2 Remote Sensing Platforms and sensor characteristics: Active and Passive Remote Sensing; PAN/Multispectral/Hyperspectral Imaging; Thermal/Microwave/Radar data [6]
2.3: Exercise on Visual Image Interpretation [4]
2.4: Exercise on Digital Image Processing I: Radiometric correction, Geometric Correction, Image Enhancement (Image Reduction & Magnification and Transect Extraction); Filtering; Image Transformation [12]
2.5: Exercise Digital Image Processing II: Classification - Non-parametric, parametric, Feature extraction, training sets – Supervised- methods and algorithms, Unsupervised and Hybrid classification [10]
2.6: Exercise on Digital Image Processing III: Accuracy Assessment; Interpretation of Error matrix and measurement of map accuracy [8]
2.7: Digital Photogrammetry: Non-oriented and oriented DSM, checking the accuracy of DSM, measuring 3D information [4]
Suggested Readings: Advanced Geoinformatics

DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

Module Name: Geo-Environmental Issues (Elective Stream I: Core Physical Geography)

Paper Type: Theory

Paper Code: GEOG 0901A

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Watershed Development and Managing Water Resources

1.1 Watershed Development: Basic concepts; Community, institutional and private sector participation; Integrated Watershed Management guidelines, programmes and agencies in India

1.2 Water resources management: Evolving agricultural practices and soil conservation norms; Traditional to recent management methods in different environments; Water in the Millennium Ecosystem Assessment Framework and Freshwater Ecosystem Services

1.3 Water Quality issues: Water quality parameters and their measurement; Types and sources of water pollution and monitoring agencies; Environmental guidelines for water quality: WHO and BIS

1.4 Storm Water and Flood Management: Design of drainage systems; Flood routing and control through embankments, channels and reservoirs; Case studies from Bihar and West Bengal

1.5 Managing Drought: Definitions, indices and classification; Drought mapping; India’s drought scenario and mitigation frameworks

1.6 Waste water reclamation techniques and applications

Figures in [ ] indicate number of credit hours allocated for the topic

Unit II: Hazards and Disasters: Concepts, Preparedness, Mitigation and Management

2.1 Hazard and Disaster: Concepts and Classifications, Frequency and Magnitude

2.2 Hazard Exposure: Factors and Consequences; Exposure Evaluation; Hazards of Place analysis and Hazardscape demarcation

2.3 Social Capacity and Capital; Vulnerability, Resilience and Adaptability: Concepts and Indices; DROP and CDR Frameworks

2.4 Hazard monitoring, tracking and modelling; Early warning systems and protocols; UNDRR Sendai Framework

2.5 Applications of Geoinformatics and emerging technologies in disaster warning, mitigation, and response

2.6 Adaptations to multi-hazard scenarios: Seismic events, Tsunamis, Slope instability, Sea-level change; Using the HAZUS Model

2.7 Emergency Sanitation/Shelters: Modalities for site selection and construction, Designing evacuation and re-settlement plans

2.8 India’s National Policy on Disaster Management; NDMA Guidelines; India Disaster Resource Network

Figures in [ ] indicate number of credit hours allocated for the topic

Suggested Readings: Watershed Analysis and Management (Elective)


Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

Module Name: Contemporary Social Issues in India (Elective Stream II: Core Human Geography)

Paper Type: Theory

Paper Code: GEOG 0901B

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Neo-Liberal Economic Policy

1.1 Neoliberalism: Meaning, emergence and historical significance; Neo-Liberal Economic Policy in India [6]
1.2 Growth and rising Social Inequality in neoliberal India [5]
1.3 Regional Imbalance in India: Emerging spatial economic disparities [5]

Unit II: Labour Problems

2.1 Agrarian distress: meaning, measures, rural income and employment situation in India [5]
2.2 Problems of floating labour in cities: rural labour out-migration, situation of floating labour in Indian cities, problems and solutions [5]
2.3 Cities and social justice in contemporary India: The relevance of slum in Indian cities; Slum development policies in India; Eviction of Squatter Settlements and Resettlement Debate [6]
2.4 Food Security and Malnutrition: Meaning, dimensions, various measures, relationship; important debate; Prevailing malnutrition situation in India [6]

Unit III: Gender and Children Issues

3.1 Gender Discrimination: Concept, forms and causes; Crime against Women in India [5]
3.2 Women Empowerment: Employment situation, Social-political participation of women [5]
3.3 Women’s reproductive health: Meaning, significance, measurement and Indian situation [5]
3.4 Child Labour in India: Meaning, causes, situation in India [5]

Suggested Readings: Contemporary Social Issues in India (Elective Stream II: Core Human Geography)

DEPARTMENT OF GEOGRAPHY  
PRESIDENCY UNIVERSITY  

Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

**Module Name:** Streamflow Behaviour and Morphology  
*(Special Paper for Elective Stream I: Option A - Fluvial Geomorphology)*

**Paper Type:** Theory  
**Paper Code:** GEOG 0902A1

**Total Marks:** 50 (Semester Examination - 35 and Internal Assessment - 15)

**Credit:** 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

**Module Evaluation:** Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

**Question Pattern** - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

**Internal Assessment (15 marks):** Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

**Unit I: Hydraulics of Channel Flow**

1.1 Classification of open channel flow, channel geometry (at-station and downstream)  
1.2 Flow continuity with special reference to Bernoulli equation  
1.3 Flow resistance: Traditional and physics-based approaches of measurement, Components, Limitations of Manning's Equation  
1.4 Turbulence in river flows: Definition, Turbulence boundary layers, Bed roughness and turbulence, Large scale morphologies and turbulent flows, flow obstruction  
1.5 Momentum transfer, velocity distributions and fluid shear stress  
1.6 Concept of stream power and specific energy, stream energy, roughness  
1.7 Concept of stream power and specific energy, stream energy, roughness  
1.8 Numerical modelling in fluvial geomorphology: Reach-scale and Catchment-scale models

**Unit II: Channel Morphology and Pattern**

2.1 Bedrock Channels: Controls, River incision processes; Geomorphic implications of knickpoints and potholes  
2.2 Meander development and morphology models, Classification schemes of meander bends, Depositional sequences in meanders  
2.3 Multi-thread Channels: Origin and conditions for channel bifurcation and braiding with differences between mountain and lowland environments; Anabranching Channels: controlling factors, types and longevity; Mechanisms of braided and anabranching stream development; Morphodynamics of multi-thread channels and their depositional sequence  
2.4 Morphologies of Step-Pool and Pool-Riffle sequences, Formation, development and links with channel planform changes, streamflow hydraulics and sediment movement  
2.5 Nature and Classification of Large Woody Debris, Impact of LWDs on stream morphology and downstream channel hydraulics  
2.6 Confluence geomorphology: Channel geometry, flow structures, sediment transport, bed morphology and depositional character of river confluences; Tributary-Main Stem interactions and feedbacks at reach and catchment scale; River confluence models  
2.7 Channel avulsion: Causes, thresholds, processes and stages; Channel avulsion models; Case study of the Kosi River  
2.8 Channel Classification Schemes: Design and Purpose; Stream and Valley Classification methods after Schumm (1972), Miall (1977), Rosgen (1994) and River Styles (2000)  
2.9 Channel stability and equilibrium: planform, cross-section and longitudinal profile adjustments; River metamorphosis: Concept and parameters, Schumm's ideas of Complex Response, Models of Planform Alteration and Stability Assessment Schemes; Five/Six Stage Channel Evolution Model and Dimensionless Stability Diagram

---

4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)
Suggested Readings: Streamflow Behaviour and Morphology

Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

Module Name: Geomorphology and Hydrology of Landscapes
(Special Paper for Elective Stream I: Option B - Physical Basis of Landscape Management)

Paper Type: Theory
Paper Code: GEOG 0902A2

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)
Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation:
- Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.
- Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.
- Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Geomorphic Processes over Landscape

1.1 Weathering: Weathering Profile; Mechanisms of rock fragmentation; Chemistry of rock transformations- chemical equilibrium, solubility and saturation, chemical weathering reactions and their controls, measurements of chemical weathering, effects on mass loss/gain and rock strength; weathering products; conversion of bedrocks into regolith; Assessing weathering intensity. [10]

1.2 Hillslope forms and processes: Slope elements and Catena; Nine-unit landsurface model; Mass balance; Diffusive processes; Hillslope processes- rainsplash, Speed of regolith movements; Landslides- forces and their balance at failure, debris flow; Hillslope models. [10]

1.3 Sediment Transport: Grain entrainment; Modes of transport- saltation, granular splash, mass flux, suspended sediment transport; Riverbed sediment characterization. [6]

Unit II: Soil Geomorphology


2.2 Profile differentiation- Elluviation-Illuviation, Organic matter decomposition, Acidification and base cycling, Leaching and Leucinization, Lessivage, Oxidation-Reduction and Gleization, Ferrolysis, Laterization and Latosolization, Desilication, Three-phase tropical pedogenesis, Rubification, Calcification, Silicification, Salinization-Solonization-Alkalization; Translocation of iron and aluminum, silt and clay; Origin of fragipan and oxic horizon. [10]

2.3 Landscape Dating Methods: Stratigraphic terminology, principles and geomorphic surfaces; Surface Exposure Dating methods based on- geomorphology and stratigraphy, weathering and weathering rinds, soil development indices, pedogenic mass balance; Chronosequence and chronofunctions; Absolute Methods- OSL, Radiocarbon and Radiometric dating techniques. [10]

Unit III: Water in the Landscape

3.1 Soil-Water Relationships: Mass-Volume relationships- porosity, bulk density, void ratio; Soil moisture conditions and plant-available water; Water Potential; Soil Moisture Retention Curve- construction and interpretation; Soil Water flow- Regulatory Forces, Darcy’s Law, Basic Equation of water flow in soil, Saturated and Unsaturated Hydraulic Conductivity; Infiltration- Infiltration in dry and wet soils, factors of infiltration, mathematical formulation; Soil-moisture distribution with depth. [10]

3.2 Landscape-Water Relationships: Water Balance; Modeling groundwater table; Runoff mechanisms and Generation of overland flow- modeling approaches. [4]
Suggested Readings: Geomorphology and Hydrology of Landscapes

DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

Module Name: Concepts and Theories of Regional Development and Urbanisation
(Special Paper for Elective Stream II: Option A - Regional Development and Urban Studies)

Paper Type: Theory

Paper Code: GEOG 0902B1

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Regional Development

1.1 Introducing Regional Development

Heritage of Regional Development from European Renaissance to Post Second World war scenario [2]

Modernization Paradigm and its effect- U.N. sponsored programmes in the national and regional development in developing countries [4]

Re-thinking on development (D.Seers, Club of Rome, Neo Marxist) [4]

1.2 Theories of Regional Development

Stage Model (Rostow and Marx) [4]

Polarized Development and Uneven Development (Perroux, Friedman, Hirschman, Myrdal) [6]

Theories of labour movement and urban economics (Berry, Davis, McGee, Fourastie) [4]

1.3 The Centrifugal Forces of Regional Integration in India

External and Internal Forces (Kashmir Insurgency, Infiltration in North Eastern India, Maoist Resistance) [4]

Social Forces (Caste Conflicts in Gangetic Plain, Reservation Conflicts in India, Religion and Issues of Minority, Language Conflicts) [4]

Political Forces (Centre State Relation, Political Violence in West Bengal, Demands of New States) [4]

Unit 2: Urbanisation

2.1 Theories of Urban Planning and Urbanisation

Pioneer thinkers in urban planning (1880-1945): Ebenezer Howard, Raymond Unwin, Clarence Perry, Patrick Geddes, [6]


Planning for cities and city regions (1945-2000) [2]

Conceptualizing the urban: Urbanization as capitalism (Harvey, Castells) [2]

Cities and production (Traditional and Marxist Rent Theory) [2]

Agglomeration economies (Krugman), urban bias (Lipton) and global cities (Friedman and Sassen) [2]

Recent Theoretical Development: Ordinary City, Planetary Urbanization and Informal Urbanization [2]

2.2 Introducing the Challenges of Urban Planning

Planning Problems in Kolkata, Delhi, Bengaluru and Mumbai [6]

Land Question in Urban Areas-Development and Disposition [2]

Cities in the Global South [2]

History, Architecture and Popular Culture [2]
Suggested Readings: Concepts and Theories of Regional Development and Urbanisation

DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

**Module Name:** Geographies of Tourism and Development Issues  
*(Special Paper for Elective Stream II: Option B - Geographies of Development)*

**Paper Type:** Theory  
**Paper Code:** GEOG 0902B2

**Total Marks:** 50  
*(Semester Examination - 35 and Internal Assessment - 15)*

**Credit:** 4 Credit Hours / week  
(4 x 16 teaching weeks = 64 credit hours per semester)

Figures in [ ] indicate number of credit hours allocated for the topic

**Module Evaluation: Semester Examination (35 marks):** Written examination of 2 hours duration will be held at semester end.

**Question Pattern:** Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

**Internal Assessment (15 marks):** Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

---

**Unit I: Basics of concepts in Geography of Tourism**

1.1 Nature, Scope and Development of Tourism Geography [3]
1.2 Changing definitions of tourism; Various tourist classification schemes [4]
1.3 Concept of touristscape, tourism typologies [2]
1.4 Tourism infrastructure and superstructures [3]
1.5 Concept of tourist accessibility and walkability [4]

**Unit II: Fundamental tourism theories and approaches**

2.1 Theories of travel motivation: Socio-psychological models of Crompton and Iso-Ahola [4]
2.2 Doxey’s Irritation Index model [2]
2.3 Butler’s Tourist Area Life Cycle model [2]
2.4 Hall’s theory of tourism market system [4]
2.5 Postmodern approaches in tourism geography [4]

**Unit III: Tourism, inequality and development**

3.1 The tourism-development dilemma [2]
3.2 Tourism, vulnerability and global environmental change [4]
3.3 Globalization, Neoliberal tourism and socio-cultural change [4]
3.4 Tourism and Justice: Tourism-Poverty nexus [2]
3.5 Postcolonial hegemony and tourism [4]

**Unit IV: Tourism planning and management**

4.1 Concepts and approaches of tourism planning and policy [2]
4.2 International governance of tourism: Manila, Kape Town, Kerala declarations [4]
4.3 Tourism Policies of India; Evolving tourism circuits [4]
4.4 Entrepreneurship, product development and tourism management [2]
4.5 Crisis Communication System and Tourism management [4]
Suggested Readings: Geographies of Tourism and Development Issues

8. Department of Tourism (2002): National Tourism Policy, Ministry of Tourism and Culture, Govt. of India
34. Sharma, K.K. (2004): Tourism and Regional Development, Sarup& Sons
Module Name: Techniques in Environmental Geography (Elective Stream I: Core Physical Geography)

Paper Type: Practical

Paper Code: GEOG 0991A

Total Marks: 50

Credit: 6 Credit Hours / week (6 x 16 teaching weeks = 96 credit hours per semester)

Module Evaluation: Continuous Evaluation throughout the Semester

Unit I: Sediment Analysis

1.1 Instruments and techniques of sediment collection and sampling(both suspended and bed) [10]
1.2 Grain-size sorting, distribution, classification and application of sytastical techniques. [14]
1.3 Facies analysis: Layer identification, pinching, flow regime, deformation, grain size. [8]

Unit II: Ecological Survey Methods

2.1 Counts: Assessing densities of large or obvious plants that are present at low density [5]
2.2 Quadrats: Measuring density, frequency, cover or biomass [5]
2.3 Point Quadrats: Estimating cover of grasses and herbs in short vegetation [5]
2.4 Transects: Line intercept, belt intercept, gradient-directed transect [5]
2.5 Mapping Terrestrial Vegetation [4]

Unit III: Land Classification Techniques

3.1 Definition and Components of Land Suitability [4]
3.2 Mapping of Land Suitability at Macro or Micro level of any part of India using the Parameters following FAO guidelines: [20]
   - Soil Reaction
   - Electrical Conductivity (EC)
   - Organic Carbon (C)
   - Availability of Nitrogen (N)
   - Available phosphorus (P)
   - Available Potassium (K)
   - Exchangeable sodium percentage (ESP)
   - Basesaturation (BS)
   - Cation exchange capacity (CEC)
   - Soil texture

Unit IV: Quantitative Techniques in Hydrology

4.1 Analysis of precipitation data at different temporal and spatial scales with appropriate numerical and GIS techniques: [10]
   - IMD Daily Data, Sub-daily data from Tropical Rainfall Measuring Mission (TRMM)
   - Estimation of Missing Data: Normal Ratio Method, Distance Power Method


4.3 Flow routing methods: Level Pool, Muskingum, Series of Reservoirs [6]

Suggested Readings: Techniques in Environmental Geography (Elective Stream I: Core Physical Geography)

Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

Module Name: Techniques in Human Geography (Elective Stream II: Core Human Geography)

Paper Type: Practical

Paper Code: GEOG 0991B

Total Marks: 50

Credit: 6 Credit Hours / week (6 x 16 teaching weeks = 96 credit hours per semester)

Module Evaluation: Continuous Evaluation throughout the Semester

Unit-I: Survey Methods

1.1 Qualitative measurement through scaling methods – Nominal scale, Ordinal scale, Ratio scale, Attitude scale [10]
1.2 Grounded Theory [6]
1.3 Concurrent Triangulation Approach [4]
1.4 In-depth Interviews [6]
1.5 Group Interviews / Focus Groups [4]
1.6 Participant Observations [4]
1.7 Biographical Research [4]
1.8 Ethnography [8]

Unit-II: Analysis Techniques

2.1 Textual Analysis / Content Analysis [8]
2.2 Narrative Analysis [8]
2.3 Conversational Analysis [8]
2.4 Discourse Analysis [4]
2.5 Article and Book review [12]
2.6 Spatial Clustering and Auto-correlation [10]

Suggested Readings: Techniques in Human Geography (Elective Stream II: Core Human Geography)

Module Name: Techniques in River Science
(Special Paper for Elective Stream I: Option A - River Science)

Paper Type: Practical
Paper Code: GEOG 0992A1

Total Marks: 50

Credit: 6 Credit Hours / week (6 x 16 teaching weeks = 96 credit hours per semester)
Figures in [ ] indicate number of credit hours allocated to that particular topic per teaching week

Module Evaluation: Continuous Evaluation throughout the Semester

Unit I: Field Measurements and Data Representation
1.1 Quantitative analysis of channel planform: Channel sinuosity and meander geometry, Braiding Index (BI) [1]
1.2 Field measurement, computation and interpretation of hydraulic parameters: Channel cross-section and Thalweg surveys, Velocity measurement by current meter, Bathymetry survey using echo-sounder, Discharge, stream power and shear stress calculations [10]
1.3 Graphical representation of hydrological data: Normal and Storm Hydrograph, Unit Hydrograph, Rating Curve, Time series analysis of Sediment and water Discharge data [8]
1.4 Identification and measurement of fluvial features from satellite images and Google Earth: River channel bars, alluvial fans and floodplain aspects; Temporal analysis of Channel planform morphology and bankline shifting [5]

Unit II: RS - GIS Application in Fluvial Studies
2.1 Digital image analysis and extraction of waterbodies-related indices from optical and thermal imagery; Enumerating LULC changes and related indices within the riparian zone [4]
2.2 Extraction of drainage network from DEM, catchment demarcation and extraction of morphometric parameters [4]
2.3 Analysis of basin linear aspects: Ordering schemes, laws of drainage composition, TDCN & TICN, drainage orientation analysis [2]
2.4 Analysis of basin areal aspects: shape parameters; basin and network ratios and relation with runoff [2]
2.5 Analysis of basin relief parameters: terrain parameters, basin hypsography and hypsometry, tectonics indices [2]
2.6 Longitudinal profiles of rivers: simple, normalised, SL index, relations with lithology and hypsometry [4]
2.7 Basin prioritisation schemes and techniques [2]
2.8 Background of Hydraulic Modelling; Channel geometry and cross-section creation; Basic flood modelling in HEC-RAS [12]
2.9 Geomorphological Mapping: defining mapping units, preparation of a geomorphological map legend, survey and map preparation [8]

Unit III: Modelling Rainfall-Runoff-Sediment Yield at Regional Scale
3.1 Theoretical Background of The Soil and Water Assessment Tool (SWAT) [4]
3.2 Gathering data: Precipitation, Topography, Land Use, Soil, Discharge and Sediment load [10]
3.3 Creating SWAT Model with ArcSWAT [10]
3.4 Automated multi-criteria model calibration and validation with SWAT-CUP [8]

Suggested Readings: Fluvial Geomorphology Practical (Elective)
5. NATMO (2000): Geomorphological Mapping, Monograph No. 01OMONO, NATMO, Kolkata
DEPARTMENT OF GEOGRAPHY  
PRESIDENCY UNIVERSITY

Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

Module Name: Techniques in Physical Landscape Analysis and Management  
(Special Paper for Elective Stream I: Option B - Physical Basis of Landscape Management)

Paper Type: Practical  
Paper Code: GEOG 0992A2

Total Marks: 50

Credit: 6 Credit Hours / week (6 x 16 teaching weeks = 96 credit hours per semester)

Module Evaluation: Continuous Evaluation throughout the Semester

Unit I: Assessment of Water and Noise Pollution

1.1 pH, Iron, Total Hardness, Salinity, Conductivity, DO TDS and Turbidity [12]
1.2 Nitrate, Nitrite, Chloride, Residual Chlorine [8]
1.3 Calculation of WQI and its application [6]
1.4 Measurement of Noise Pollution [8]

Unit II: Environmental Survey and Data Analysis

2.1 Perception Survey Techniques, preparation of Survey Schedule and Questionnaires for perception survey [6]
2.2 Likert Scale Surveys and Application of Ridit Method to Likert Scale Surveys [6]
2.3 SWOT Analysis [6]
2.4 Environmental Impact Assessment Methodologies [6]

Unit III: Laboratory Analysis of Soil Samples

3.1 Soil Sampling: Site selection, digging soil pit, Sample collection, Preparing soil sample for analysis [6]
3.2 Particle Size Analysis by sieving and sedimentation; Determination of soil texture [6]
3.3 Determination of Specific Gravity and Bulk Density by Gravimetric Method [8]
3.4 Determination of oxidizable carbon and soil organic matter by Wet Combustion Method [8]
3.5 Determination of Soil pH by Colourimetric Method [4]
3.6 Basics of Spectrophotometry and determination of Ammoniacal Nitrogen using Spectrophotometry [6]

Suggested Readings: Techniques in Physical Landscape Analysis and Management (Elective)

Module Name: Techniques in Regional and Urban Analysis
(Special Paper for Elective Stream II: Option A - Regional Development and Urban Studies)

Paper Type: Practical
Paper Code: GEOG 0992B1

Total Marks: 50
Credit: 6 Credit Hours / week (6 x 16 teaching weeks = 96 credit hours per semester)
Figures in [ ] indicate number of credit hours allocated to that particular topic per teaching week

Module Evaluation: Continuous Evaluation throughout the Semester

Unit 1: Demographic Analysis
1.1 Geographic Distribution of Population: Lorenz Curve, Accessibility Index, Location quotient [8]
1.2 Measure of Migration: Gravity Model [8]
1.3 Spatial Analyses of Population: Moran’s I, Geographically Weighted Regression [8]
1.4 Population Projection [8]

Unit 2: Techniques in Regional Analysis
2.1 Input Output Analysis and estimation of final demand [6]
2.2 Linear Programming Problem - Transport Problem - North West Corner Method [6]
2.3 Choice of indicators - Axiomatic Principles [4]
2.4 Calculation of growth rates: Arithmetic, Geometric and Exponential [6]
2.5 Drawing of Isodopane through Weberian Technique [4]

Unit 3: Measuring urban form
3.1 Extraction of Built up Area (BAEM, SLEA, DMSP) [6]
3.2 Growth Types (Infill, Edge, Outlying) [4]
3.3 Urban Sprawl (Sprawl Metrics, Landscape Matrix) [4]
3.4 Growth Prediction: Integration of CA-Markov Model, Artificial Neural Network (ANN) [6]

Unit 4: Environment and Urbanization
4.1 Urban Ecosystem Service Assessment. [4]

Unit 5: Infrastructure, basic services and finance
5.1 Assessment of Splintered Urbanism: Drinking water [4]
5.2 Housing demand analysis: Hedonic price model [4]

Suggested Readings: Techniques in Regional and Urban Analysis
Module Name: *Methods in Developmental Geographies*  
*(Special Paper for Elective Stream II: Option B - Geographies of Development)*

**Paper Type:** Practical  
**Paper Code:** GEOG 0992B2

**Total Marks:** 50  
**Credit:** 6 Credit Hours / week (6 x 16 teaching weeks = 96 credit hours per semester)

Figures in [ ] indicate number of credit hours allocated to that particular topic per teaching week

**Module Evaluation:** Continuous Evaluation throughout the Semester

### Unit 1: Social Indicators of development and Community development

1.1 Compositing indices: Problems of synthesising a large complex of body of data into smaller dimensions; Choice of variables in construction of indicators, weightage and ranking method, Range equalisation techniques  
   \[4\]

1.2 Social Indicators: Construction of Social Indicators: Education, Housing and Crime  
   \[10\]

1.3 Measuring Wellbeing: Construction of Quality of Life Indicators  
   \[6\]

1.4 Livelihood Analysis: Methods  
   \[4\]

1.5 Community development research tools: Uses of Participatory Rural Appraisal (PRA) / Rapid Rural Appraisal (RRA)  
   \[8\]

### Unit 2: Methods in Tourism Geography

2.1 Interview structuring, Designing questionnaires for tourism related surveys and application of Likert scale  
   \[4\]

2.2 Delphi technique and its application in tourism research  
   \[4\]

2.3 Technique of multi-criteria decision making in tourism: Analytic Hierarchy Process and SWOT  
   \[6\]

2.4 Tourists’ Satisfaction Index  
   \[4\]

2.5 Structural Equation Modelling in Tourism Analysis  
   \[4\]

2.6 Application of Geographical Weighted Regression model in tourism studies  
   \[4\]

2.7 Network analysis in tourism  
   \[4\]

2.8 Preparation of tourist literature with emphasis on mapping  
   \[2\]

### Unit 3: Measuring Agricultural Development

3.1 Delimitation of agricultural regionalization; Methodology for agriculture regionalization: cropping pattern & crop concentration  
   \[4\]

3.2 Measurement of crop diversification (Bhatia and Gibb’s-Martin)  
   \[4\]

3.3 Measurement of crop productivity (W.M. Yang, Singh, Shafi); Measurement of agricultural efficiency (Shafi and Enayedi)  
   \[6\]

3.4 Representation of Agricultural data: Land use, distribution of crops, Trends in area, production and yield of crops  
   \[4\]

3.5 Correlation of different variables relating to agricultural development in India or in any part of the country  
   \[4\]

3.6 Farm Survey: Preparation of survey schedules - Farmers survey - Buying behavior of agricultural inputs; Farmers' marketing practices: Regulated market and its role in marketing of farm produce  
   \[10\]

### Suggested Readings: *Methods in Developmental Geographies*


Module Name: *Dissertation Methods*

**Paper Type:** Practical

**Total Marks:** 50

**Credit:** 6 Credit Hours / week (6 x 16 teaching weeks = 96 credit hours per semester)

Figures in [ ] indicate number of credit hours allocated to that particular topic per teaching week

**Module Evaluation:** Continuous Evaluation throughout the Semester

The content for this module shall be framed separately by the respective Dissertation Supervisor(s) for each candidate, on the basis of their determined Dissertation Topics and aspects allied to it.

The framed content(s) of this Module for each student shall be submitted by the respective Supervisors before the commencement of the Semester.

A Candidate shall be judged on the content framed specifically for him / her for this Module in the Continuous Evaluation Mode.
DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

Module Name: Regional Geomorphic Entities (Elective Stream I: Core Physical Geography)

Paper Type: Theory  Paper Code: P10  Course No.: GEOG 1001A

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)
Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Deltaic Environments
1.1 Developments in Delta studies [1]
1.2 Delta Evolution Models: Hinterland and receiving basin characteristics; Delta front development, progradation and lobe morphology; Delta abandonment processes and characteristics of moribund channels [6]
1.3 Sediment dynamics, succession and facies in fluvial and tide-dominated deltas: Sediment aggradation/degradation mechanisms; Sediment induced deformation; Impacts of tectonics and offshore morphology [5]
1.4 Classification, architecture and evolution of Large River Deltas in different environments: High destructive waves, High constructive lobate, High destructive tide, High constructive elongate [4]
1.5 Regional geomorphology of the Ganga-Brahmaputra-Meghna and Okavango Deltas [5]

Unit II: Estuarine Environments
2.1 Definitions, distribution, fomational factors, typical characteristics, dimensions and geomorphic classification of estuaries [2]
2.2 Water mixing, sediment flux and transportation mechanisms in estuaries; Estuarine morphodynamics: effects of sea level, tides, waves, currents, river discharge and tectonics; Morphological attributes of the fluvio-tidal transition zone [4]
2.3 Estuarine sedimentary facies in different geomorphic settings: tide-dominated, wave-dominated, mixed wave-tide-dominated and river-dominated environments; Life cycles of estuarine islands [3]
2.4 Estuarine sub-environments: Characteristics of Lower and upper tidal zones, tidal creeks, mudflats, salt marshes and lagoons [3]
2.5 Global, climatic and regional controls on mangrove development; Water movement, wave dissipation and sedimentation processes in mangroves; Mangrove degradation causes and restoration programmes [5]
2.6 Estuarine habitats and their ecosystem services; Impacts of aquaculture and agriculture on estuarine ecology [2]
2.7 Regional geomorphology of the Narmada estuary [2]

Unit III: Plateau and Plateau Fringe Environments
3.1 Plateau formation mechanisms; Plateau types: Stratigraphy, denudation rates and soil characteristics [4]
3.2 Tors and inselberges: Formation processes and theories; Examples from Western Bengal, Dartmoor and Southern Africa [5]
3.3 Laterites and lateritic landscapes: leaching processes, profile characteristics, duricrust formation; Gullying processes and soil loss from lateritic landscapes [4]
3.4 Planation surfaces: Development, tectonic deformation and palaeoclimatic imprints; Case studies of Chotanagpur and Deccan [3]
3.5 Hydroclimatic extremities and changing ecosystems of plateau provinces: Examples from the Tibetan and Meghalaya Plateaux [2]
3.6 Runoff and sediment regimes of shield and cratonic rivers: Case studies of Tapi and Kaveri Rivers [4]
Suggested Readings: Regional Geomorphic Entities (Elective Stream I: Core Physical Geography)

6. Defining the Delta: Multidisciplinary Perspectives on the Lower Mississippi River Delta, Edited by Janelle Collins, Copyright Date: 2015 Published by: University of Arkansas Press DOI: 10.2307/j.ctt1ffjg6m
8. JANOK P. BHATTACHARYA, Robert E. Sheriff, Professor Of Sequence Stratigraphy, Geosciences Department, SR1 Rm. 312, University Of Houston, 4800 Calhoun Rd., Houston, Texas 77204-5007, U.S.A.
9. Juan Miguel Ramírez-Cuesta1*, Inmaculada Rodríguez Santalla1 And Fernando Barrio-Parra1 Application Of Methods For Change Detection To Identify Geomorphological Changes. Case Study: Mouth Of The Ebro Delta, 1 Universidad Rey Juan Carlos, Dpto. De Biología Y Geología, C/Tulipán S/N, 28933 Móstoles (Spain).
20. T. Elliott, Chapter 6 Deltas.
25. Walker, r.g., and harms, j.c., 1971, the “catskill delta”: a prograding muddy shoreline in central pennsylvania: journal of geology, v. 79, p. 381–399.
26. Walker, r.g., and plint, a.g., 1992, wave- and storm-dominated shallow marine systems, in walker, r.g., and james, n.p., eds., facies models:
DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

Module Name: Geography of Development and Political Economy (Elective Stream II: Core Human Geography)

Paper Type: Theory  Paper Code: GEOG 1001B

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)
Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce, class presentation, group discussion, written examination, assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit 1: Geography of Development

1.1 Conceptualizing Development: The meaning of the word ‘development’; Critical Reflection on the ‘nature’ of development; Alternative interpretations of development; Measuring Development: from GNP to HDI [8]

1.2 Spatializing Development: The emergence of the Third World; Critiques of the Third World; Third World since the 1990s [6]

1.3 Governing Development: Geographies of Globalization: Market-led development; The role of the state in human development and economic development; Development performance across Indian states: role of governments [6]

1.4 Paradigms of development: Relative poverty and inequalities at a global scale; Poverty and SDGs; Sustainable Development: Goal 2030; Current Discourses in Development; Alternative Development Paradigms: Civil Society, Social Capital and Non Governmental Organisation [12]

Unit 2: Political Economy


2.2 Contemporary Political Economy of India: Post Independent Political Economy- Politics of Clientelism; Markets and Politics- Politics of Economic Reform and Depression; Political Economy of Voting Behaviour-Democracy [12]
Suggested Readings: *Geography of Development and Political Economy*

17. Ravenhill, John – *Global Political Economy*.
Module Name: Sediment in the Fluvial System  
(Special Paper for Elective Stream I: Option A- Fluvial Geomorphology)

Paper Type: Theory  

Paper Code: GEOG 1002A1

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Sediment Genesis

1.1 Runoff generation: patterns and controls on overland flow; Hortonian, Hewlettian and Variable Source Area concepts of overland flow production; Runoff mechanisms and processes in cold, temperate, arid and humid environments  
1.2 Water flow at the plot scale: Soil hydrology and preferential flow phenomena; Unsaturated and saturated flow and solute transport; Sediment transport capacity of overland flow  
1.4 Channel initiation and network development: models and mechanisms  
1.5 Sediment budgets of riparian environments; Sediment sources, Hillslope-channel connectivity and sediment delivery mechanisms; Flash floods and sediment transfer; Mean sediment residence time; Global denudation and erosion rates  
1.6 Slope-catchment influence on sediment transfer and river channel morphology; Components of the sediment cascade  
1.7 Sediment stratigraphy: Composition, texture and internal features; Relationships with underlying and overlying layers; Succession, grain size distribution and flow behavior linkages; Facies coding schemes; Estimating palaeofloods from sediment deposits  
1.8 Anthropogenic impacts on runoff and sediment amounts; Land use and sediment yield correlations; Formation of valley plugs and phytogeomorphic response; Faunal influences in sediment genesis and modification of geomorphic forms  
1.9 Riverbank failure factors processes and mechanisms; Bank erosion measurement and hazard assessment: tools and techniques; Structural and vegetation-based erosion mitigation measures: types, pros and cons, implementation

Unit II: Sediment Flux

2.1 Processes of erosion in alluvial channels  
2.2 Critical shear stress: Definition and Estimation, Sediment entrainment and transport, Armour formation  
2.3 Bed parameters and sediment motion; Flow turbulence and sediment motion  
2.4 Sediment transport rate; Sediment sorting and orientation during erosion and deposition  
2.5 Suspended load: Suspension of cohesive and non-cohesive sediment- Effect of size and stratification  
2.6 Bedload: Characteristics, Grain Kinematics, Eulerian approach of measuring bedload transport rates  
2.7 Effect of sediment transport on flow characteristics

Suggested Readings: Slope - Sediment Continuum

Module Name: Assessing Landscape and Water Quality  
(Special Paper for Elective Stream I: Option B - Physical Basis of Landscape Management)

Paper Type: Theory

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Figures in [ ] indicate number of credit hours allocated for the topic

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce, class presentation, group discussion, written examination, assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Landscape Quality Assessment
1.1 The Ecological Profile of Landscape Assessment: Principles and Definitions, Landscape Ecology Indicators, Structural Control Indices, Spatial Indices, Numeric Indices, Functional Control Indices [6]
1.3 Landuse Indicators for Landscape Assessment: Principles and Definitions, Territorial-use Indicators [3]
1.4 Assessing the Economic Aspect of Landscape: Principles and Definitions, Economic Landscape Indicators, Assessment of Expenses for the Conservation of Natural Landscape [5]
1.5 Indicators for Assessing the Landscape Transformation on a Regional and Local scale [3]

Unit II: Water Quality Monitoring and Management
2.1 Sources and Effects of Water Pollution: Toxic Metals and Other Inorganic Pollutants, Organic Pollutants, Nutrients, Micro-organisms, Irrigation-Induced Contamination and Other Non-Point Source Water Pollutants [3]
2.2 Water Quality Parameters for Surface Water, Ground Water, Drinking Water [3]
2.3 Water Quality Monitoring: WHO Guidelines and Country Standards; Clean Water Act, Safe Drinking Water Act; Drinking water Quality Regulation; Threats to the safety of drinking water and approaches to meeting those threats; Water Quality Index [4]

Unit III: Water Footprint and Pricing
3.1 Water Footprint Assessment: Goals of water footprint assessment; water footprint sustainability assessment; water footprint response formulation [6]
3.2 Water Footprint Accounting: Blue Water Footprint, Grey Water Footprint, Green Water Footprint; Water footprint calculation within a geographically delineated area; Water footprint accounting for municipalities, or other administrative units [6]
3.3 Water Pricing: Tariff design, payment behaviour and willingness to pay, subsidies and targets [3]

Unit IV: Grey Water and Green Landscape
4.1 Greywater systems, sources and Greywater flow estimate: Definition and types of Greywater systems, identification of grey water systems, Calculating greywater flow, estimating flow rate of different fixtures [6]
4.2 Choosing a Greywater System: System design consideration, Using greywater indoor, choosing a greywater irrigation system, outdoor fixtures, whole-house greywater systems, subsoil infiltration systems, greywater for greenhouses, constructed wetlands. [6]
4.3 Installing a laundry to landscape system [3]
Suggested Readings: Assessing Landscape and Water Quality

DEPARTMENT OF GEOGRAPHY  
PRESIDENCY UNIVERSITY  

Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

**Module Name:** Sustainable Urban Development  
*(Special Paper for Elective Stream II: Option A - Geography of Development and Planning)*

**Paper Type:** Theory  
**Paper Code:** GEOG 1002B1

**Total Marks:** 50  
(Semester Examination - 35 and Internal Assessment - 15)

**Credit:** 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Figures in [] indicate number of credit hours allocated for the topic

**Module Evaluation:** Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

**Question Pattern** - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

**Internal Assessment (15 marks):** Mode of Internal Assessment (through viva-voce, class presentation, group discussion, written examination, assignment or any other method) will be notified for chosen topic(s) during the Course.

**Unit I: Making of an urban ‘place’: Community and Neighbourhood**

1.1 Suburbanisation; challenges for today’s planners [2]
1.2 Healthy Communities: Migration and mobility; Connectivity, Density and Walkability [4]
1.3 Role of planners; Planning cities as loci of production and consumption [3]

**Unit II: Communities and Planning**

2.1 Urban Poverty: Measures of urban poverty; cities as sites for poverty reduction [5]
2.2 Affordable housing; Refugee crisis [4]
2.3 Urban Risks and Vulnerabilities; Safety and Violence (Case Study) [5]

**Unit III: Human Development in Cities**

3.1 Urban Public Health: Health services and planning solutions [4]
3.2 Education and skills; women in informal economy [4]
3.3 Gender Equality; Law, Human Rights and Justice [6]

**Unit IV: Planning for Sustainable City:**

4.1 Types of Urban Plan India: Master Plan/Development Plan, Transportation Plan; Strategic Plan; City Development Plan, Area Development Plan [4]
4.3 Cities’ Future: New Town, Smart Growth/Compact City, Green City and Urban Agriculture, Resilient City [4]
4.4 Land management for planning: Land acquisition and land pooling model, TDR, FSI, FAR [4]

**Unit V: Implementing the changes**

5.1 United Cities and Local Governments (UCLG) [2]
5.2 International Council for Local Environmental Initiatives (ICLEI) [4]
5.3 UN-Habitat & International Development and Financing agencies [4]
5.4 Urban innovation: community-based organizations and civil society [3]
Suggested Readings: Sustainable Urban Development

4. GOLD III: Basic Services for all in an Urbanizing world, UCLG, 2013
5. GOLD IV 2016, Fourth Global Report on Decentralization and Local Democracy, Co-Creating The Urban Future - The Agenda Of Metropolises, Cities And Territories - by UCLG
7. International guidelines on urban and territorial planning, UN Habitat, 2015
8. LSECities : New Urban Governance - Urban complexity and institutional capacities of cities - Data and Publications
10. World Bank on Urban Water
12. World Cities Report 2016, UN-Habitat
13. World Disasters Report 2010 - Focus on Urban Risk
14. World Urbanization Prospects (Interactive Data), United Nations Populations Division
15. World Urbanization Prospects 2014: Highlights
Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

Module Name: Social Well-Being and Community Development with special reference to India
(Special Paper for Elective Stream II: Option B - Geographies of Development)

Paper Type: Theory

Paper Code: GEOG 1002B2

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Figures in [ ] indicate number of credit hours allocated for the topic

Module Evaluation:

Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce, class presentation, group discussion, written examination, assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit-I Development Geography and Welfare Tradition

1.1 Geographies of development: nature, and scope; Welfare Geography: nature, scope and emergence [4]

1.2 Social wellbeing: meaning, philosophical and methodological issues of human wellbeing; Needs and wants: different explanations- Maslow; Quality of life: meaning, criteria, approaches, and significance [4]

1.3 The consumption satisfaction approach to well-being; Social welfare function, just distribution of welfare, social conflict and welfare distribution; Theory of income and marginal productivity [6]

1.4 Spatial distribution of well-being: Theoretical issues to arrive at the spatial distribution of wellbeing; Judging distribution: Social contracts and distributive justice [6]

Unit-II Social Wellbeing in the Indian Context

2.1 Education and Wellbeing: Dimensions of education and Wellbeing; Structure of educational system in India; Education policies in India: Sarva Siksha Abhiyan, Right to Education Act [8]

2.2 Housing and wellbeing: housing as basic human rights; Dimensions of housing and social wellbeing; Housing problems in India; Government policies [8]

2.3 Crime and social wellbeing: Crime: meaning, nature and significance in geographical studies; Radical critique by Peet on the geography of crime; Typology of crimes and various schemes of classification; Patterns of the incidence of crime in India and its socio-geographical correlates [8]

Unit-III Community Development

3.1 Community development: Definition and concept, Bottom up approach [3]

3.2 Tribal development approaches in India: Nehru and Elwin’s perspective [3]

3.2 Tribal development programmes and policies: Health, Education, Poverty and Employment [6]

3.3 Development induced displacement of tribes: Issues and policy [4]

3.4 Forest right and tribal livelihood question: Forest Right Act 2006 [6]
Suggested Readings: Social Well-Being and Community Development with special reference to India

6. Freudenberge K. S., Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA)-A manual for CRS field works and partners, Maryland.
DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

Module Name: Riverine Landscape Components and Management
(Special Paper for Elective Stream I: Option A - River Science)

Paper Type: Theory

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce, class presentation, group discussion, written examination, assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: River Landscape Components

1.1 Drainage Basin Evolution: the ergodic hypothesis and physical simulation
1.2 River terraces: Types and formation mechanisms; Typical characteristics of strath and fill terraces with respective facies models; Interpreting terrace chronology with implications for climate-tectonic forcing; Case Studies from Garhwal or Sikkim
1.3 Alluvial fans: Boundary conditions for formation; Origin and growth processes and models of fan evolution; Alluvian Fan shapes and Fan lobe development; Hydraulic and sediment fluxes in fan domains; Typical fan sedimentology, stratigraphy and facies; Neotectonics and landform deformation in fan area; Case Studies from the Himalayas
1.4 Valley fills and floodplains: Conditions for creation and common formation processes (lateral, vertical, braided channel and counter-point accretion), Typical sedimentation characteristics of floodplains constructed by sinuous, braided and anabranching streams; Genetic Classification (Nanson and Croke, 1992), Floodplain re-working processes (lateral migration, cut-offs, splays, floodplain stripping) and floodplain transformations; Floodplain sediment succession with alteration of facies layering and palaeo-fluvial regimes; Floodplain geomorphic units their form-process relations; Negative relief of large floodplains: formation and hydrological importance; Case Study of the Brahmaputra valley
1.5 In-stream geomorphic units: Types (sculpted coarse and fine-grained, mid-channel, bank-attached features) and their form-process interpretations
1.6 Bedforms: Theories of initiation and development, Typology and Classification (Lower and Upper Regimes and Bedform Phases), Flow characteristics over bedforms and linkages with sediment transport; Typical bedform configurations in gravel-bed and sand-bed channels; Bedform preservation and their sedimentary structures

Unit II: Riparian Interlinkages and River Management

2.1 River Continuum Concept: Stream hierarchy and ecosystem communities structure and stability; Flood Pulse Concept: Basis, functions and human alterations; Nutrient Spiralling Concept: Basis and pathways; Serial Discontinuity Concept: Stream impoundment issues; Streams Functions Pyramid: Components, measures and assessment methods
2.2 Vegetation and stream morphology linkages: Lateral zonation and longitudinal distribution of plant communities and their structures; Hydrogeomorphic controls on vegetation dynamics and succession; Vegetation impacts on flow resistance and sediment transport; Conceptual Models of Vegetation-Hydrogeomorphology interactions (Gurnell et al. 2015) and feedbacks; Channel stage linkages with riparian habitats and accrued ecosystem benefits (Cluer and Thorne, 2013)
2.3 Fluvial hydrosystems approach: Concept and components; Channel-floodplain connectivity: importance, interlinkages, measures and models, Floodplain-Channel disconnection causes and reconnection methods with impacts on riparian corridor ecology and benefits
2.4 Hyporheic Exchange Flows: Importance, Controlling factors, Variations along channel types and across channel geomorphic units, Nature of losing and gaining reaches
2.5 Environmental flows: Concept; Natural flow regimes and alteration consequences; Ecological importance of E-flow components; Frameworks for determining E-flow requirements: BBM, DRIFT and ELOHA; E-flow issues and concerns
2.6 River Restoration: Common goals; Rapid Geomorphic Assessment of streams; Typical structural (channelisation and vanes) and non-structural (root-based soil reinforcement, floodplain zonation, dam removal) measures and their impacts on channel functions and riparian ecology; Assessment of river recovery potential and trajectories (Fryirs, 2016); River restoration examples
Suggested Readings: *Riverine Landscape Components*

Module Name: Integrated Landscape and Water Management
(Special Paper for Elective Stream I: Option B - Physical Basis of Landscape Management)

Paper Type: Theory

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)

Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Landscape Ecology
1.1 Introduction to landscape ecology: Definition of Landscape; Concept of Landscape Ecology [2]
1.2 Landscape pattern formation: Physical and Biotic processes; Disturbance regimes [4]
1.3 Landscape dynamics: Concepts of Landscape dynamics; Modelling Landscapes; Landscape disturbance-succession models [4]
1.4 Consequences of landscape pattern: Populations and communities; Landscape genetics and ecosystem processes [4]

Unit II: Landscape Change
2.1 Patterns of landscape change; Landscape in species perspective- Landscape contour model; Pattern-based landscape models; Loss, degradation, fragmentation and isolation of habitats- nature, causes and impacts on individual species; Changes in behaviour, biology and specie interactions; Specie extinction prone-ness criteria [7]
2.2 Human modification of landscape- patch-size reduction, species-area relationships; types of edge effects; landscape connectivity-concepts, quantification, features contributing to connectivity, wild-life corridors; nestedness- concept, significance, quantification, mechanisms for nested assemblage [7]
2.3 Managing landscape patterns: Restoration of large patches, native matrix, buffers, corridors and landscape heterogeneity; maintenance of Keystone and endangered species [5]

Unit III: Landscape and Water Management
3.1 Landscape management. –How humans approach the management of complex landscapes to achieve management objectives; Conservation biology and ecosystem management [4]
3.2 Landscape Management using Green Infrastructure Practices: Bioswales; Permeable pavements; Green roofs, Urban Tree canopy [4]
3.4 Rain Gardens: Definition and concept of rain garden; role of rain garden in soil and water conservation; fundamental traits and needs of a rain garden; designing a rain garden relative to the specific needs of a location; considering climate, topography and native vegetation; planter boxes [5]

Unit IV: Landscape Modelling
4.1 GIS-based Ecological modelling: ArcGIS toolkits for connectivity and corridor modelling, habitat modelling and linkage design [4]
4.2 Computation of landscape metrics using FRAGSTATS [3]
4.3 Introduction to Spatial Modelling Environmental (SME): Workspace configuration, Unit model development in STELLA, importing modules, simulation Module Markup Language, model configuration, model building, running models [7]
Suggested Readings: Integrated Landscape and Water Management


Module Name: Urban Governance, Infrastructure and Development
(Special Paper for Elective Stream II: Option A - Regional Development and Urban Studies)

Paper Type: Theory
Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)
Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.
Question Pattern - Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.
Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit 1: Urbanization, Urban Growth and Urban Restructuring
1.1 Urbanization cycle, Stages of urban development: Klaassen et al and Berg et al. [4]
1.2 Contemporary thesis of urbanization in South Asia: Unregulated Growth, Exclusionary Urbanization, Polarization Reversal, Extended Metropolis, Ruralopolis, Subaltern Urbanization. [6]

Unit 2: Governance- Finance, Infrastructure and Basic Services
2.1 Urban governance: Concept, stakeholders, participation; 74th CAA. Crisis of governance in the census towns. Forms of Urban government and their institutional frameworks. [6]
2.2 Sources of municipal revenue and fields of expenditure; Municipal budget analysis (Decentralization Index and devolution index) [4]
2.3 Basic Urban Services: water and sanitation. [3]
2.4 Financing Infrastructure and basic services: Traditional and innovative financing. [3]

Unit 3: Urban Housing and Neighborhood Change
3.1 Urban housing policies in India. [2]
3.2 Housing submarkets in India. [2]
3.4 Neighborhood Change: Concept and models (Downs and Bourne). [4]
3.5 Residential segregation: Concept, theories (Spatial Assimilation and Spatial stratification theory). [4]

Unit 4: Issues of Sustainability in Urban Services and Governance
4.1 Sustainable services: Infrastructure and Transport Planning [3]
4.2 Urban Energy System [3]
4.3 SDGs: Measuring and Monitoring [3]

Unit 5: Measuring Urban Forms and Inequality
5.1 Components of urban growth and their measurement [2]
5.2 Peri-Urban Land use Dynamics: Application of Mixed Method (Defining Agreement, Evidence and Confidence Level) [4]
5.3 Measuring Inequalities - Dissimilarity Index and Herfindahl Index. [4]
Suggested Readings: *Urban Governance, Infrastructure and Development*

DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

Module Name: Agricultural Geography
(Special Paper for Elective Stream II: Option B - Geographies of Development)

Paper Type: Theory
Paper Code: GEOG 1003B2

Total Marks: 50 (Semester Examination - 35 and Internal Assessment - 15)
Credit: 4 Credit Hours / week (4 x 16 teaching weeks = 64 credit hours per semester)

Module Evaluation: Semester Examination (35 marks): Written examination of 2 hours duration will be held at semester end.

Question Pattern: Four Long-answer type questions each of 10 marks (may be split into two parts, one carrying 2 marks at most) will be set for answering any two and five semi-long answer type questions, each of 5 marks will be set for answering any three.

Internal Assessment (15 marks): Mode of Internal Assessment (through viva-voce / class presentation / group discussion / written examination / assignment or any other method) will be notified for chosen topic(s) during the Course.

Unit I: Approaches, Parameters and Agricultural Systems

1.1 Approaches to Agriculture Geography: commodity, systematic, regional and ecological
1.2 Determinants of agricultural development: physical, technological, institutional; World agricultural systems
1.3 Role of agro based industries in employment, Agriculture in GDP

Unit II: Water and Agriculture

2.1 Water use efficiency in agriculture; Water-efficient irrigation: prospects and difficulties of innovative practices; Watershed development for water use efficiency in the agriculture sector.
2.2 Economic Characteristics of water; Dominance of agricultural water use; Pressures on the supply of water for irrigation; Role of water in agricultural development
2.3 Sources of irrigation: Tube well, pumpssets, canals, RLI; irrigated and unirrigated area; irrigation efficiency; management
2.4 Types of irrigation system in India; Groundwater and surface water use for agriculture; Programs supporting irrigation in India; Irrigated farming and Dry farming: Concepts and principles.

Unit III: New Dimensions in Agriculture

3.1 Mechanization of agriculture: need, scope and progress of mechanization
3.2 Diffusion of agricultural innovations: social diffusion and spatial diffusion; agribusiness; contract farming; corporate agriculture
3.3 Risk and Uncertainty in Production: input related risk and risk aversion; Adoption of modern technology under production uncertainty
3.4 The National Agricultural policy; evaluation of the new agricultural policy

Unit IV: Contemporary Issues in Indian Agriculture

4.1 Agricultural credit; Agricultural Price Policy; Agricultural subsidies
4.2 Poverty alleviation strategies; Food aid (OXFAM) and nutrition programmes
4.3 Food security and its components; agriculture Indebtedness; Causes of famer’s suicide
4.4 Sustainable development of agriculture; decline in agricultural sector in India
Suggested Readings: *Agricultural Geography*

Module Name: Fieldwork Project

Paper Type: Practical

Total Marks: 50

Module Evaluation: Part Evaluation based on performance in the Field and during preparation of the Field Report, Part Evaluation based on Presentation and Viva Examination at semester end

One proto-type research project based on guided tour type or pseudo-experimental fieldwork has to be undertaken. Candidates are expected to make factual or values enquiry using objective or subjective data, respectively, through the sequential stages of observation and perception; definition and description; analysis and explanation; prediction and evaluation; and decision-making. Following is a list of possible topics for project work.

Physical Geography Topics (For Elective Stream I):

- People-environment relationship
  - hazards like- flood, slope instability etc. and perception of such hazards (related to frequency, severity, risk etc.)
  - pattern and fluctuation of pollution within an area
  - effects of tourism pressure on a local beauty spot
  - conflicts of interest over landuse change
  - causes and effects of soil/land erosion
  - environments costs and economic benefits of development projects
  - environmental and ecological effects of excessive water abstraction

- Comparing contrasting places
  - two stretches of coasts with respect to forms, processes, habitats etc.
  - two rivers or different stretches of one river with respect to morphology, hydrology, ecology etc.
  - soils up a catena
  - a succession of sand dunes
  - areas of two different rock types
  - local climate of two slopes, in and out of a town, in and out of a forest

- Temporal changes
  - Time scale may vary from a few days to few months or even years. But methods for collecting / deriving temporal data are to be so chosen that they yield comparable data sets.
  - variations in beach profiles in different seasons of the year
  - effects of deforestation or expansion of built-up area on sediment yield
  - pattern of shoreline changes
  - shifting of river
  - change of vegetal cover
  - erosion/accretion of riverine islands

- Analysis of distributions
  - landforms, drainage patterns
  - sediment characteristics
  - meanders and ox-bow lakes
  - soil types, plant associations
  - nature and amount of slope

- Analysis of processes
  - weathering and erosion, mass movement
  - factors controlling river hydrograph
  - beach processes
  - development of soil profile, ecosystem processes

Human Geography Topics (For Elective Stream II)

- Investigating local issues
  - disadvantaged inner-city areas/housing estates
  - decaying green belts
  - provision for an aging population
  - rise in criminal activities
  - impacts of the construction of a super market
  - environmental/economic impacts of opening of a new bypass

- Examining a theory
  - Central Place theory
  - models of urban morphology
  - von Thunen’s model of agricultural landuse
  - demographic transition model

- Comparing contrasting places
  - areas of influence of three/four urban centres
  - two or more markets
  - two or more urban wards/boroughs/neighbourhoods

- Temporal changes
  - population characteristics of a country/state/urban centre over a Century
  - characterization and impacts of social change in a rural village/urban centre
  - landuse in rural/urban area
  - gentrification of a small inner city area
  - shop types along a major road

- Analysis of distributions
  - ethnic groups
  - health facility centres
  - crime
  - diseases and morbidity
  - schools
  - deep tube wells for irrigation

- Study of People’s behaviour
  - shopping behaviour
  - household movement
  - tourism and recreation
  - residential preference
  - health related practices (smoking, alcoholism, physical exercise etc.)
Module Name: **Dissertation Project**  
Paper Type: Dissertation  
Total Marks: 50

**Module Evaluation:** Part Evaluation based on performance in the Field and during preparation of the Dissertation Report and its Research and Academic Quality, Part Evaluation based on Presentation and Viva Examination at semester end

**Dissertation Report** comprises an object-specific, goal-oriented Geographical Study based on the following types:

1. those which test a hypothesis or theory, as virtually all aspects of Geography have theories attached to them,
2. those which compare the geographical characteristics of two places or phenomena. A variation on this theme is a comparison of the geographical characteristics of one place or phenomena at two or more stages of time, i.e., a study of changes over time,
3. those which study a geographical problem related to the habitat, economy and society of people.

Each Examinee shall prepare a Dissertation Paper individually under the supervision of a Departmental Faculty on his / her own chosen Theme.

The Report must be documented in triplicate (1 = examinee, 2 = seminar library, 3 = supervisor) under the following Heads -  
**Introduction & Conceptual Background; Statement of the Problem; Objectives of Study; Literature Review; Methodology including data / information / map collection; Location of the Study Area; Analysis, Display and Interpretation of Data (relating to each Objective separately); and Conclusion.**

The Dissertation Paper should contain **Acknowledgement, Preface, Table of Content, List of Tables, List of Figures, List of Photographs, List of References, Appendix, and Bibliography / Reference.**

Pages containing Illustrations (Sketches, Graphs, Diagrams, Maps, Photographs, etc) = 40 (maximum).

Word Limit = 10000 (maximum) excluding Tables and Appendix (Computer typed, Line Spacing = 1½; Font = Arial Narrow / Times New Roman / Calibri; Font size = 10 / 11).

Each Examinee shall present his / her Paper before an audience comprising Internal / External Examiners and others on the day of Examination using OHP or LCD Projector (maximum 25 slides about - concept / idea / theme; major objectives; methodology; study area; observations and analysis; conclusion).

Marks on performance of individual students during preparation of the Dissertation Report and its content (= 15) shall be awarded by the Internal Examiner(s) and on the Research and Academic Quality of the Report followed by the Presentation and Viva Voce (= 35) by the External Examiner(s).