

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



(w.e.f. Academic Session 2019 - 2020)



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Content

Topic	Page No.
A. Semester-wise Course Structure and Module Compositions	2 - 4
B. Detailed Syllabus and Suggested Reading List for respective Modules	5 - 58
<i>Geotectonics and Geomorphology</i>	5
<i>Social Geography and Population Geography</i>	7
<i>Environment and Land Use</i>	9
<i>Research Methodology and Survey Techniques</i>	10
<i>Approaches to Modelling and Qualitative Data Analysis</i>	11
<i>Climatology and Oceanography</i>	12
<i>Regional Planning and Geography of Trade and Transport</i>	14
<i>Philosophy of Geography and Geopolitical Issues</i>	16
<i>Advanced Analytical Techniques</i>	18
<i>Advanced Geoinformatics</i>	19
<i>Geo-environmental Issues (Elective Stream I: Core Physical Geography)</i>	20
<i>Contemporary Social Issues in India (Elective Stream II: Core Human Geography)</i>	21
<i>Streamflow Behaviour and Morphology (Elective Stream I: Option A - River Science)</i>	22
<i>Geomorphology and Hydrology of Landscapes (Elective Stream I: Option B - Physical Basis of Landscape Management)</i>	24
<i>Concepts and Theories of Regional Development and Urbanisation (Elective Stream II: Option A - Regional Development and Urban Studies)</i>	26
<i>Geographies of Tourism and Development Issues (Elective Stream II: Option B - Geographies of Development)</i>	28
<i>Techniques in Environmental Geography (Elective Stream I: Core Physical Geography)</i>	30
<i>Techniques in Human Geography (Elective Stream II: Core Human Geography)</i>	31
<i>Techniques in River Science (Elective Stream I: Option A - River Science)</i>	32
<i>Techniques in Physical Landscape Analysis and Management (Elective Stream I: Option B - Physical Basis of Landscape Management)</i>	34
<i>Techniques in Regional and Urban Analysis (Elective Stream II: Option A - Regional Development and Urban Studies)</i>	35
<i>Methods in Developmental Geographies (Elective Stream II: Option B - Geographies of Development)</i>	36
<i>Dissertation Methods</i>	37
<i>Regional Geomorphic Entities (Elective Stream I: Core Physical Geography)</i>	38
<i>Geography of Development and Political Economy (Elective Stream II: Core Human Geography)</i>	40
<i>Sediment in the Fluvial System (Special Paper for Elective Stream I: Option A - River Science)</i>	42
<i>Assessing Landscape and Water Quality (Special Paper for Elective Stream I: Option B - Physical Basis of Landscape Management)</i>	43
<i>Sustainable Urban Development (Special Paper for Elective Stream II: Option A - Regional Development and Urban Studies)</i>	45
<i>Social Well-Being and Community Development with special reference to India (Elective Stream II: Option B - Geographies of Development)</i>	47
<i>Riverine Landscape Components and Management (Special Paper for Elective Stream I: Option A - River Science)</i>	49
<i>Integrated Landscape and Water Management (Special Paper for Elective Stream I: Option B - Physical Basis of Landscape Management)</i>	51
<i>Urban Governance, Infrastructure and Development (Elective Stream II: Option A - Regional Development and Urban Studies)</i>	53
<i>Agricultural Geography (Special Paper for Elective Stream II: Option B - Geographies of Tourism and Development Issues)</i>	55
<i>Fieldwork Project</i>	57
<i>Dissertation Project</i>	58

Semester-wise Course Structure and Module Composition

Semester	Papers	No. of Modules	Credit	Marks	Total Marks
Semester - I	Theory	3	12	150	250
	Practical	2	8	100	
Semester - II	Theory	3	12	150	250
	Practical	2	8	100	
Semester - III	Theory	2	8	100	250
	Practical	3	12	150	
Semester - IV	Theory	3	12	150	250
	Practical	2	8	100	
Total	Theory	11	44	550	1000
	Practical	9	36	450	

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

Paper Type	Paper Name	Paper Code	Credits
Theory	Geotectonics and Geomorphology	GEOG 0701	4
Theory	Social Geography and Population Geography	GEOG 0702	4
Theory	Environment and Land Use	GEOG 0703	4
Practical	Research Methodology and Survey Techniques	GEOG 0791	4
Practical	Approaches to Modelling and Qualitative Data Analysis	GEOG 0792	4

Semester : Second Year : First

Paper Type	Paper Name	Paper Code	Credits
Theory	Climatology and Oceanography	GEOG 0801	4
Theory	Regional Planning and Geography of Trade and Transport	GEOG 0802	4
Theory	Philosophy of Geography and Geopolitical Issues	GEOG 0803	4
Practical	Advanced Analytical Techniques	GEOG 0891	4
Practical	Advanced Geoinformatics	GEOG 0892	4

Semester : Third Year : Second

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

Semester : Fourth Year : Second

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

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: GEOG 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)

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: Geotectonics and Landforms

- 1.1 Global Topography and Hypsography [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 models 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 Anthropocene [3]
- 2.2 Field and Laboratory experiments in Geomorphology: Design, relevance and scaling [2]
- 2.3 Systems Approach in Geomorphology: Feedback Mechanisms, Ideas of Equilibrium, Threshold, Sensitivity, Ergodicity and Hysteresis [4]
- 2.4 River metamorphosis: Concepts, mechanisms and planform changes; 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]
- 3.3 Karst and Lateritic Landscapes in Tropical Humid Environments: formation, evolution, human modifications [4]
- 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]
- 4.6 Geodiversity: Basic concepts and measurements, Geoheritage and Geoconservation [2]

Suggested Readings:

1. Anderson, R.S. and Anderson, S.P. (2010): *Geomorphology: The Mechanics and Chemistry of Landscapes*, CUP, Cambridge
2. Bierman, P.R., Montgomery, D.R. (2014): *Key Concepts in Geomorphology*. W.H. Freeman and Co.
3. Bishop, M.P. (2013.): Remote sensing and GI Science in geomorphology: introduction and overview. In: Shroder, J. (Editor in Chief), Bishop, M.P. (Ed.), *Treatise on Geomorphology*. Academic Press, San Diego, CA, vol. 3
4. Bloom, A.L. (2002): *Geomorphology: A Systematic Analysis of Late Cenozoic Landforms*, Prentice Hall, Upper Saddle River, NJ
5. Butler, D.R., Hupp, C.R. (2013): The role of biota in geomorphology: Ecogeomorphology. In: Shroder, J. (Editor in chief), Butler, D.R., Hupp, C.R. (Eds.), *Treatise on Geomorphology*. Academic Press, San Diego, CA, vol.12
6. Chorley, R.J. and Kennedy, B.A. (1971): *Physical Geography: A Systems Approach*, Prentice Hall, Upper Saddle River, New Jersey
7. Condie, K.C. (2003): *Plate Tectonics and Crustal Evolution*, Butterworth-Heinemann, Oxford, Burlington
8. Cooke, R.U., Doornkamp, J.C. (1990): *Geomorphology in environmental management. A New Introduction*, Clarendon, Oxford.
9. Darby, S., Sear D. (eds.) (2008): *River Restoration: Managing the Uncertainty in Restoring Physical Habitat*. John Wiley & Sons, Ltd
10. DWAF: Department Of Water Affairs and Forestry (2009): *Rapid Habitat Assessment Model Manual*. Report no RDM/Nat/00/CON/0707. Authors: Louw, D., Kleynhans, C.J. Submitted by Water for Africa
11. Faniran, A. and Jeje, L.K. (1983): *Humid Tropical Geomorphology*, Longman, London
12. Firsch, W., Meschede, M. and Blakey, R. (2011): *Plate Tectonics, Continental Drift and Mountain Building*, Springer-Verlag, Berlin
13. Goudie, A.S. (1990): *Geomorphological Techniques*, Unwin Hyman, London
14. Goudie, A.S. (ed.) (2004): *Encyclopaedia of Geomorphology*, Routledge, London
15. Goudie, A.S. and Viles, H. (2010): *Landscapes and Geomorphology: A Very Short Introduction*, Oxford University Press, Oxford
16. Gray, M. (2013): *Geodiversity: Valuing and Conserving Abiotic Nature*. Wiley-Blackwell
17. Gregory K.J., Goudie A.S. (eds.) (2011); *The SAGE Handbook of Geomorphology*
18. Gutierrez, M. (2013): *Geomorphology*, CRC Press, Boca Ranton, Florida
19. Hamblin, W.K. and Christiansen, E. (2003): *Earth's Dynamic Systems*, Prentice Hall, Upper Saddle River, New Jersey
20. Huggett, R.J. (2011): *Fundamentals of Geomorphology*, Routledge, New York
21. Kale, V.S. and Gupta, A. (2001): *Introduction to Geomorphology*, Orient Longman, Kolkata
22. Keary, P. and Vine, M. (1997): *Global Tectonics*, Blackwell Scientific Publications, Oxford
23. Leopold, L. B., Wolman, M. G. and Miller, J. P. (1964): *Fluvial Processes in Geomorphology*, W.H. Freeman, San Francisco
24. Ollier, C.D. (1981): *Tectonics and Landforms*, Longman Group Ltd., London
25. Owen, L.A. (2013): Tectonic geomorphology: a perspective. In: Shroder, J. (Editor in Chief), Owen, L.A. (Ed.), *Treatise on Geomorphology*. Academic Press, San Diego, CA, vol. 5
26. Owens, P.N. and Slaymaker, O. (2004) *Mountain Geomorphology*, Routledge
27. Reynard, E, Brilha, J. (2017): *Geoheritage: Assessment, Protection, and Management*. Elsevier
28. Richards, K. (1982): *Rivers: Form and processes in alluvial channels*, Methuen, London
29. Sack, D., Orme, A.R. (2013): Introduction to the foundations of geomorphology. In: Shroder, J. (Editor in Chief), Orme, A.R., Sack, D. (Eds.), *Treatise on Geomorphology*. Academic Press, San Diego, CA, vol. 1
30. Schumm, S.A. (1977): *Fluvial Systems*, Wiley, New York
31. Selby, M.J. (1985): *Earth's Changing Surface: An Introduction to Geomorphology*, Clarendon Press, Oxford
32. Small, R.J. (1978): *The Study of Landforms: A Textbook of Geomorphology*, Cambridge University Press, Cambridge
33. Summerfield, M.A. (1991): *Global Geomorphology: An Introduction to the Study of Landforms*, Longman, London
34. Summerfield, M.A. (ed.) (2000): *Geomorphology and Global Tectonics*, Wiley, Chichester
35. Thomas, M.F. (1994): *Geomorphology in the Tropics: A study of weathering and denudation in low latitudes*, Wiley, Chichester
36. Thorn, C. (1988): *Introduction to Theoretical Geomorphology*, Unwin Hyman, Boston
37. Young, A. (1972): *Slopes*, Oliver and Boyd, Edinburgh

DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for First Semester of the Postgraduate Course in Geography

Module Name: *Social Geography and Population Geography*

Paper Type: Theory

Paper Code: GEOG 0702

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: Elements of Indian Society

1.1 Concept of Caste, Class and Ethnicity 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 and Ethnicity

[2]

1.2 Religion and Tribal Identity

Concept of Religion: Major religions- World and India, Minority population and issues of communalism

[4]

Tribes concept, spatial distribution in India, Tribes in India: Concept and spatial distribution; Tribal Society and 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 Justice: Concept, Constitutional Provisions, Social Security

[4]

2.3 Social problems in India- Social exclusion, backwardness and deprivation of SC, ST population

[4]

2.4 Socio-spatial inequality in Education and Health

[4]

Unit III: Population in India

3.1 Ageing of population; Occupational structure: Census, NSSO; Types of workers: regular, salaried, self-employed, casual; Determinants of workforce

[4]

3.2 Impact of migration on population change and economy of source area and destination

[2]

3.3 Population problems with special reference to India: Food, housing, unemployment and poverty

[4]

3.4 Population policies: Pre-independence, Post-independence, National Population Policy (NPP) 2000

[4]

Unit IV: Morbidity and Mortality

4.1 Need and importance of the study of Morbidity and Mortality; Measures of Morbidity; Interrelationships between measures of morbidity, Incidence and prevalence rates

[6]

4.2 Direct and indirect techniques of standardization of mortality rates; Measures of infant mortality (IMR)- Neo-natal (early and late) and post-Neonatal mortality; Importance of Infant mortality in population and health

[6]

4.3 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

[6]

Suggested Readings: Social Geography

1. Ahmad, A. (1999): *Social Geography*, Rawat Publications, Jaipur and New Delhi
2. Anderson, K. (2006): *Race and Crises of Human Development*, Routledge, London and New Delhi
3. Beteille, A. (1983): *Equality and Inequality*, Oxford University Press, New Delhi
4. Brewer, J.D. (2000): *Ethnography*, Open University Press, Buckingham, Philadelphia
5. Casino, V.J.D., Jr., (2009): *Social Geography: A Critical Introduction*, Wiley-Blackwell, Chichester
6. Coates, B.E., Johnston, R.J. and Knox, P.L. (1977): *Geography and Inequality*, Oxford University Press, Oxford and London
7. Dubey, S.C. (1991): *Indian Society*, National Book Trust, New Delhi
8. Eyles, J. (ed.) (1986): *Social Geography in International Perspective*, Rowman and Littlefield, New Jersey and Los Angeles
9. Forde, C.D. (1934): *Habitat, Economy and Society*, Methuen and Company, London
10. Gore, M.S. (1985): *Social Aspects of Development*, Rawat Publications, Jaipur
11. Gregory, D. and Larry, J. (eds.) (1985): *Social Relations and Spatial Structures*, MacMillan, London
12. Hammett, C. (eds.) (1996): *Social Geography: A Reader*, Arnold, London
13. Haq, M. (2000): *Reflections on Human Development*, Oxford University Press, New Delhi
14. Jackson, P. and Susan, J.S. (1984): *Exploring Social Geography*, George Allen and Unwin, Boston and Sydney
15. Jones, E. (ed.) (1975): *Readings in Social Geography*, Oxford University Press, London
16. Mishra, R.P., Sundram, K.U. and Prakash Rao, V.V.S. (1974): *Regional Development Planning in India*, Vikas Publishing, Delhi
17. Norton, W. (2006): *Cultural Geography: Environments, Landscapes, Identities, Inequalities*, Oxford University Press, Toronto
18. Planning Commission, Government of India (1981): *Report on Development of Tribal Areas*, New Delhi
19. Sahlin, M.D. (1968): *Tribesmen*, Prentice Hall, Upper Saddle River, New Jersey
20. Sharma, K.L. (1980): *Essays on Social Stratification*, Rawat Publications, Jaipur and New Delhi
21. Smith, D. (1977): *Geography: A Welfare Approach*, Edward Arnold, London
22. Sopher, D. (1980): *An Exploration of India: Geographical Perspectives on Society and Culture*, Cornell University Press, Ithaca, New York
23. Subba R.B. (1958): *Personality of India: Pre- and Proto- Historic Foundation of India and Pakistan*, M.S. University Baroda, Vadodara
24. Valentine, G. (2001): *Social Geographies: Space and Society*, Prentice Hall, Harlow, U.K.

Suggested Readings: Population Geography

1. Administrative Staff College of India, A comparative assessment of the Burden of Disease in selected states: Methodology, results, policy and program intervention. Research Paper No. 2.
2. Bhende, Asha and Tara Kanitkar, Principles of Population Studies, Himalaya Publishing House, Bombay (Chapter 7).
3. Coale, Ansley J. and Paul, Demney, Regional Model Life Tables and Stable Populations, Academic Press, New York.
4. Government of India, National Child Survival and Safe Motherhood Program, Ministry of Health and Family Welfare, New Delhi.
5. Jagger, C. Health Expectancy calculation by the Sullivan Method: A Practical Guide, NUPRI, Research Paper Series No. 68.
6. Murray C. J. L. and A.D. Lopez, Global and regional cause -of-death patterns in 1990, Bulletin of the WHO, 72(3): 447-480.
7. Murray C. J. L., J. A. Salomon, C. D. Mathers and A. D. Lopez, Summary Measures of Population Health: Concepts, Ethics, Measurement and Applications. WHO, Geneva.
8. Murray, C. J. L., B. D. Ferguson, A. D. Lopez, M. Guillot, J. A. Salomon and O. Ahmad, Modified logit life table system: Principles, empirical validation and application, Population Studies 57 (2): 1-18.
9. United Nations, Health and Mortality Issues of Global Concern, Proceeding of the Symposium on Health and Mortality, Brussels, 19-22 November 1997.

**DEPARTMENT OF GEOGRAPHY
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Detailed Syllabus for First Semester of the Postgraduate Course in Geography

Module Name: *Environment and Land Use*

Paper Type: Theory

Paper Code: GEOG 0703

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 | [4] |
| 1.2 Social Vulnerability and Environmental Change; Environmental Justice | [5] |
| 1.3 Alternative views on Climate Change | [3] |
| 1.4 Big dams versus small dams | [3] |
| 1.5 Lentic Ecosystems: Characteristics and Habitats | [3] |
| 1.6 International and Inter-State Water Dispute in Indian subcontinent | [4] |
| 1.7 Municipal Solid Waste: Disposal Recovery and Management | [5] |
| 1.8 Plastic and Micro-plastic Pollution: Threats to Aquatic Ecosystems | [2] |
| 1.9 Documentary Analysis: The Inconvenient Truth, Before the Flood, Ice on Fire | [3] |

Unit II: Land Use

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 2.1 Land: Concept, attributes of land; Land Capability Classification (USDA); Land as a Common Resource; Land as the basis of ecology and society | [4] |
| 2.2 Approaches to land use studies; Multi-temporal land use/land cover change detection; Analysis of change dynamics | [6] |
| 2.3 Impact of land use/ land cover change on groundwater recharge; GIS-based soil erosion assessment and digital soil mapping | [6] |
| 2.4 Impact of land use on soil resource; Irrigation and soil degradation | [4] |
| 2.5 Land use change; Global food production and food security | [6] |
| 2.6 Impact of urbanisation and infrastructural development on land and soil | [6] |

Suggested Readings: Environment and Land Use

- Bell, M.M. (2012): *An Invitation To Environmental Sociology*, Sage, New Delhi
- Botkin, D.B., and Keller, E.A. (2013): *Environmental Science*, Wiley, New Delhi
- Elliott, L. (2004): *The Global Politics of the Environment*, Palgrave Macmillan, New York
- Forman, R.T.T. (1995): *Land Mosaics: The Ecology of Landscapes and Region*, Cambridge University Press, Cambridge
- Jana, N.C. and De, N.K. (1997): *The Land- Multifaceted Appraisal and Management*, Sribhumi Publishing Company, Kolkata
- Mather, A.S. (1986): *Land use*, Wiley.
- Mollinga, P.P., Dixit, A. and Athukorala, K. (eds.) (2006): *Integrated Water Resources Management : Global Theory, Emerging Practice and Local Needs*, Sage, New Delhi
- Turner, M.G. (2011): *Landscape Heterogeneity and Disturbance*, Springer, London
- Turner, M.G., Gardner, R.H. and O'Neill, R.V. (2001): *Landscape Ecology in Theory and Practice: Pattern and Process*, Springer Science & Business Media, New York
- Vink, A.P.A. (1983): *Landscape Ecology and Land Use*, Longman, London and New York
- Wright, R.T. and Boorse, D.F. (2011): *Environmental Science: Toward A Sustainable Future*, PHI Learning Private Limited, New Delhi

DEPARTMENT OF GEOGRAPHY
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Detailed Syllabus for First Semester of the Postgraduate Course in Geography

Module Name: *Research Methodology and Survey Techniques*

Paper Type: Practical

Paper Code: GEOG 0791

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 [7]
- 1.2 Theorizing our World- ontology, epistemology, research paradigms, methods and methodology; Types of logical reasoning- Inductive, Deductive and Abductive [6]
- 1.3 Nature and objectives of research; Research Types: descriptive-analytical, pure-applied, conceptual-empirical, qualitative-quantitative [5]

Unit II: Research Process

- 2.1 Steps in Research process [3]
- 2.2 Needs and objectives of Literature Review; Conducting literature survey- searching literature, reviewing selected literature, developing theoretical and conceptual frameworks, Reporting literature review [6]
- 2.3 Citation methods- foot note, text note, end note, bibliography, annotated bibliography and citation rules [6]
- 2.4 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 [6]
- 2.5 Hypothesis: Definition, sources, roles and types of hypothesis; Tests of hypothesis with small and large samples; Type I and Type II Errors in testing hypotheses [6]
- 2.6 Research Strategies: Case studies, Experiments, Ethnography, Phenomenology, Grounded Theory, Action Research [6]
- 2.7 Data Collection Methods: Questionnaire, Interview, Focus Group, Participant Observation; Sampling- Concept, principles, factors affecting inferences drawn from a sample; Types of sampling- random and probability sampling designs, systematic sampling; Sample size calculation [10]

Unit III: Reading a Scientific Research Paper

- 3.1 Introduction Section: Background, Hypothesis/Research Question, Premise, Logic, Novelty [5]
- 3.2 Material and Method Section: Research Design, Data/Materials used, Sampling Strategy, Techniques used [6]
- 3.3 Result Section: Coherence, Reliability and validity of data; Important observations [5]
- 3.4 Discussion Section: Interpretation of results and main conclusions [5]

Unit IV: Surveying Methods

- 4.1 Fundamentals of TS survey and Terrain Mapping with DEM and TIN generation [7]
- 4.2 DGPS Survey techniques [7]

Suggested Readings: *Research Methodology and Survey Techniques*

1. Clifford, N., Cope, M., Gillespie, T., & French, S. (Eds.). (2016). *Key methods in Geography*. Sage.
2. Gomez, B., & Jones III, J. P. (Eds.). (2010). *Research methods in geography: A critical introduction* (Vol. 6). John Wiley & Sons.
3. Hegde, D. S. (Ed.). (2015). *Essays on research methodology*. Springer.
4. Kleiner, S. (1993). *The logic of discovery: A theory of the rationality of scientific research*. Springer Science & Business Media.
5. Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners*. Sage Publications Limited.
6. Locharoenrat, K. (2017). *Research Methodologies for Beginners*. Pan Stanford.
7. Mellenbergh, G. J., & Adèr, H. J. (Eds.). (1999). *Research Methodology in the Life, Behavioural and Social Sciences*. Sage.
8. Pruzan, P. (2016). *Research methodology: the aims, practices and ethics of science*. Springer.
9. Singh, Y. K. (2006). *Fundamental of research methodology and statistics*. New Age International.
10. Yeong, F. M. (2014). *How to Read and Critique a Scientific Research Article: Notes to Guide Students Reading Primary Literature (with Teaching Tips for Faculty Members)*. World Scientific Publishing Company.

Detailed Syllabus for First Semester of the Postgraduate Course in Geography

Module Name: *Approaches to Modelling and Qualitative Data Analysis*

Paper Type: Practical

Paper Code: GEOG 0792

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] |
| 1.4 Introduction to numerical methods- Ordinary Differential Equations, Partial Differential Equations, Polynomial Approximations, Finite Differences and Finite elements | [10] |
| 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*

- Auerbach, C.F. and Silverstein, L.B. (2003): *Qualitative Data: An Introduction to Coding and Analysis*, New York University Press
- Bar-Yam, Y. (2000): *Dynamics of Complex Systems*, Perseus Books, Reading
- Bazeley, P. (2007): *Qualitative Data Analysis with NVivo*, SAGE Publications, London
- Chatfield, C. (1995): *The Analysis of Time Series: An Introduction*, Chapman & Hall, Boca Raton
- Gibbs, G. (2002): *Qualitative Data Analysis: Explorations with NVivo*, Open University, London
- Guermond, Y. (ed.) (2008): *The Modeling Process in Geography: From Determinism to Complexity*, John Wiley & Sons, London
- Rapoport, A. (1983): *Mathematical Models in Social and Behavioral Sciences*, John Wiley & Sons, New York
- Richards, L. (1999): *Using NVIVO in Qualitative Research*, SAGE Publications, London
- Sanders, L. (ed.) (2007): *Models in Spatial Analysis*, ISTE Ltd., London
- Smith, J. and Smith, P. (2011): *Environmental Modelling: An Introduction*, Oxford University Press, Delhi
- Strauss, A.L. (1987): *Qualitative Analysis fo Social Scientists*, Cambridge University Press, Cambridge
- Swan, A.R.H., Sandilands, M. and McCabe, P. (1995): *Introduction to Geological Data Analysis*, Blackwell Science Ltd., Oxford
- Wainwright, J. and Mulligan, M. (Eds.) (2004): *Environmental Modelling: Finding Simplicity in Complexity*, Wiley & Sons Ltd., Chichester
- Wilson, A.G. and Kirkby, M.J. (1980): *Mathematics for Geographers and Planners*, Oxford University Press, Oxford

DEPARTMENT OF GEOGRAPHY

PRESIDENCY UNIVERSITY

Detailed Syllabus for Second Semester of the Postgraduate Course in Geography

Module Name: *Climatology and Oceanography*

Paper Type: Theory

Paper Code: GEOG 0801

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: Atmospheric Thermodynamics and Dynamics

- 1.1 Atmospheric Thermodynamics: Equations of state for ideal gases, Specific Gas Constant; First Law of Thermodynamics- Work, Internal Energy, Entropy, Specific Heat Capacity [2]
- 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

- 3.1 Evolution of Ocean Floor Morphostructure: Actualistic Model [3]
- 3.2 Upper Ocean Structure and Processes [4]
- 3.3 Vorticity, Deep Ocean Circulation and Ocean Waves [3]
- 3.4 Langmuir Currents and Thermohaline Circulation, Instability and Ocean Heat Budget [4]
- 3.5 Ocean Current Temperature and its relation with El-Nino [3]
- 3.6 Tides: generating forces, types, theories and effects [3]

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]
- 4.3 Marine and Coastal Area Management Policies: EEZ, CRZ, ICZM [4]

Suggested Readings: Climatology

1. Ackerman, S.A. and Knox, J.A. (2012): *Meteorology: Understanding the Atmosphere*, Jones & Bartlett Learning, London
2. Atkinson, B. W. (Ed.) (1981): *Dynamical Meteorology: An Introductory Selection*, Methuen, London
3. Barry, R.G. and Chorley, R.J. (2003): *Atmosphere, Weather and Climate*, Routledge, London
4. Byers, H. R. (1974): *General Meteorology*, McGraw-Hill Book Company, New York
5. Chandrasekar, A. (2010): *Basics of Atmospheric Science*, PHI Learning Pvt. Ltd., New Delhi
6. Houghton, J. (2002): *Physics of Atmosphere*, Cambridge University Press, Cambridge
7. Mclveen, R. (2010): *Fundamentals of Weather and Climate*, Oxford University Press, Oxford
8. Rayner, J.N. (2001): *Dynamic Climatology - Basis in Mathematics and Physics*, Blackwell Publishers Ltd., Oxford
9. Rohli, R.V. and Vega, A. J. (2012): *Climatology*, Jones & Bartlett Learning, London
10. Thompson, R. D. (1998): *Atmospheric Pressures and Systems*, Routledge, London
11. Uman, M. A. (1984): *Lightning*, Dover-Publications, New York
12. Wallace, J.M. and Hobbs, P.V. (1977): *Atmospheric Science:- An Introductory Survey*, Academic Press, New York

Suggested Readings: Oceanography

1. Davis, R.J.A. (1986): *Oceanography - An Introduction of the Marine Environment*, Win C. Brown, Iowa
2. Day, T. (2006): *Oceans*, Chelsea House, New York
3. Erickson, J. 2003): *Marine Geology: Exploring the New Frontiers of the Ocean*, Facts on File, Inc., New York
4. Garrison, T. (2009): *Essentials of Oceanography*, Brooks/Cole, Belmont, California
5. Ilyin, A.V. (2003): *Evolution of the Ocean Floor Morphostructure - Actualistic Model*, in Evans, I.S., Dikau, R. Tokunaga, E., Ohmori, H. and Hirano, M. (eds.) *Concepts and Modelling in Geomorphology: International Perspectives*, Terrapub, Tokyo, pp. 43-59
6. King, C.A.(1962): *Oceanography for Geographers*, Edward Arnold, New York
7. Pinet, P.R. (2009): *Invitation to Oceanography*, Jones and Bartlett Publishers, Sudbury, Massachusetts
8. Robert, C.M. (2009): *Global Sedimentology of the Ocean: An Interplay between Geodynamics and the Palaeoenvironment*, Elsevier, Amsterdam
9. Stahler, A.N. and Stahler A.N.(1997): *Geography and Man's Environment*, John Wiley and Sons, New York
10. Thorpe, S.A., Steele, J.H., Turekian, K.K. (eds.) (2009): *Elements of Physical Oceanography*, Academic Press, London
11. Thurnman, H.V.(1978): *Introduction to Oceanography*, Charles E. Merrill Pub. Co., London
12. Weyl, P.K. (1970): *Oceanography: An Introduction of the Marine Environment*, John Wiley and Sons Ltd., London

DEPARTMENT OF GEOGRAPHY
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Detailed Syllabus for Second Semester of the Postgraduate Course in Geography

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)

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: 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 (cul de sac); backward region [2]
- 1.3 Regional delineation: Physical and economic (Chatterjee, Nath, Bhat, Sdasyuk and Sengupta). [6]
- 1.4 Techniques in regional analysis: Regional Multiplier; Input-output, export based model [3]

Unit II: Planning in India

- 2.1 Balanced and unbalanced growth in India; Centralized and Decentralized Regional Planning Process [3]
- 2.2 Impact of New Economic Policies on regional inequality in India: Location of new regional economic activities [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 Regional Planning in WestBengal: Rural (Panchayati Raj) and Metropolitan Planning [4]

Unit III: Geography of Transport and Trade

- 3.1 Geography of Transportation and its significance [2]
- 3.2 Modes of transport and Comparative costadvantages [4]
- 3.3 Environment and transport: positive and negative dimensions [2]
- 3.4 Transport Network Analysis: Topology, Graph Theory; Accessibility and Connectivity- Network and nodal connectivity (Inter-regional and Intra-regional) [6]
- 3.5 Models of transport: Spatial interaction model, Traffic analysis and congestion model, UrbanTransportproblems [8]
- 3.6 GATT, WTO and TRIPS: Functionsand relevance [6]
- 3.7 World Trade Blocs; Global Conflict on Energy Resources [4]

Suggested Readings: *Regional Planning and Geography of Trade and Transport*

1. Acharyya, J. (2015): FDI and Regional Disparity in India, *Journal of Public Administration*, 62 (4), pp. 1336-1349
2. Black, W. R. (2003): *Transportation: A Geographical Analysis*, Guilford Press, New York
3. Chand, M. and Puri, V.K. (1983): *Regional Planning in India*, Allied Publishers, New Delhi
4. Chandna, R. C. (2005). *Regional Planning and Development*, Kalyani Publishers, Kolkata.
5. Claval, P. (1998). *An Introduction to Regional Geography*. Blackwell Publishers, USA
6. Dubey, K. N. (1991): Public Policy, Structural Inequality and Regional Disparities in India, *Journal of Public Administration*, 37 (2), pp. 199-207
7. Hensher, D.A. (2004): *Handbook of Transport Geography and Spatial Systems*, Volume 5 of *Handbooks in Transport*, Elsevier, Oxford
8. Hoyle, B.S., and Knowles, R.D. (eds.) (1992): *Modern Transport Geography*, Belhaven Press, London
9. Raychaudhuri, J. (2001): *An Introduction to Development and Regional Planning: With Special Reference to India*, Orient Blackswan, New Delhi
10. *Regional Imbalances and Role of Planning in India* (http://www.jrdp.in/currentissue/2_2_persp.pdf)
11. Rodrigue, J.P., Comtois, C. and Slack, B. (2006): *The Geography of Transport Systems*, Routledge, London, New York
12. Sanga, P. and Shaban, A. (2017): Regional Divergence and Inequalities in India, *Economic and Political weekly*, 52 (1), pp. 102-110.
13. Sanyal, B. M. (2001). *India: Decentralized Planning; Themes and Issues*. Concept Publishing Company, New Delhi
14. Saxena, H. M. (2005): *Transport Geography*, Rawat Publication, New Delhi
15. *The Town and Country Planning Act, India* (<http://faolex.fao.org/docs/pdf/jam71240.pdf>)
16. White, H.P. and Senior, M.L. (1983): *Transport Geography*, Longman, Hong Kong

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 Positivist, Nomothetic, Post-Positivist Approaches in Geography; Development of Radical/Critical Geography: Laws and models of geographical enquiry [6]
- 1.2 Geography of Inequality and Welfare Geography: 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 [5]
- 1.6 Critical Geography: Frankfurt School of Critical Theory, Critical Revolution in Geography, Critical Geographies World View [5]

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 Collapse; Resurgence of Right-Wing Politics- 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*

1. Agnew, J., (2002): Making Political Geography, Arnold, London
2. Agnew, J., Mitchell, K. and Toal, G. (eds.) (2003): A Companion to Political Geography, Blackwell, Oxford
3. Bowen, M. (1981): Empiricism and Geographical Thought, Cambridge University Press, Cambridge
4. Christopher Layne, The Peace of Illusions: American Grand Strategy from 1940 to the Present (Cornell University Press, 2006)
5. Cohen, S. (1964): Geography and Politics in a World Divided, Random House, New York
6. Cox, K.R., (2002): Political Geography: Territory, State and Society, Wiley-Blackwell, Chichester
7. Cox, K.R., Low, M. and Robinson, J. (2008): The SAGE Handbook of Political Geography, SAGE Publications Ltd., London
8. Cresswell, T. (2013): Geographic Thought- A Critical Introduction. Wiley-Blackwell, Chichester
9. de Blij, H.J. and Glassner, M. (1968): Systematic Political Geography, John Wiley & Sons, New York
10. Dickinson, R.E. (1969): Makers of Modern Geography, Routledge, London
11. Dikshit, R.D. (1987): Political Geography and Geopolitics, Tata McGraw Hill, New Delhi
12. Dikshit, R.D. (2000): Political Geography: A Contemporary Perspective, Prentice-Hall, New Delhi
13. Dikshit, R.D. (2004): Geographical Thought: A Critical History of Ideas, Prentice Hall of India, New Delhi
14. Edward Soja, Postmodern Geographies: The Reassertion of Space in Critical Social Theory (Verso:second edition, 2011)
15. Freeman, T.W. (1961): A Hundred Years of Geography, Gerald Duckworth, London
16. Gallaher, C., Dahlman, C.T., Gilmartin, M., Mountz, A. and Shirlow, P. (2009): Key Concepts in Human Geography: Key Concepts in Political Geography, SAGE Publications Ltd., London
17. Gearoid O Tuathail, Simon Dalby and Paul Routledge, eds. The Geopolitics Reader, second edition (Routledge, 2006)
18. Glassner, M., (1993): Political Geography, John Wiley & Sons, New York
19. Gregory, D. (1978): Ideology, Science and Human, Geography, Hutchinson, London
20. Hartshorn, R. (1959): Perspectives on the Nature of Geography, Rand MacNally and Co., Chicago
21. Hartshorne, R. (1939): The Nature of Geography, Association of American Geographers, Lancaster
22. Harvey, D. (1969): Explanation in Geography, Arnold, London
23. Harvey, D. (1973): Social Justice and the City, Arnold, London
24. Henderson, G., Waterstone, M. (2009): Geographic Thought- A Praxis Perspective, Toutledge, Oxon.
25. Holt-Jenson, A. (2018): Geography- History and Concepts, Fifth Edition (Sage, London)
26. James Scott. The Art of Not Being Governed: An Anarchist Reading of Upland Southeast Asia (Yale University Press, 2010)
27. James, P.E. (1972): All Possible Worlds: A History of Geographical Ideas, The Odyssey Press , Indianapolis
28. Jason Dittmer and Joanne Sharp, eds. Geopolitics: An Introductory Reader (Routledge, 2014)
29. John Agnew, Geopolitics: Re-Visioning World Politics, second edition (Routledge, 2003)
30. Johnston, R., Gregory D., Pratt G., Watts M. and Whatmore, S. (2003): The Dictionary of Human Geography, Blackwell, Oxford
31. Johnston, R.J. (1983): Geography and Geographers, Edward Arnold, London
32. Johnston, R.J. (1985): The Future of Geography, Methuen and Company Ltd., New York
33. Johnston, R.J. and Sidaway, J.D. (2004): Geography and Geographers, Edward Arnold, London
34. Jones, M., (2004): An Introduction to Political Geography: Space, Place and Politics, Routledge, London
35. Klaus Dodds, Geopolitics: A Very Short Introduction (Oxford University Press, 2014)
36. Mark Monmonier, How to Lie with Maps (University of Chicago Press, 2nd edition, 1996)
37. Martin, G. (2005): All Possible Worlds: A History of Geographical Ideas, Oxford University Press, New York
38. Max Boot, Invisible Armies: An Epic History of Guerilla Warfare from Ancient Times to the Present (Liveright, 2013)
39. Painter, J. and Jeffrey, A. (2009): Political Geography, SAGE Publications Ltd., London
40. Paul Virilio, Open Sky (Verso, 2008)
41. Peet, R. (1998): Modern Geographical Thought, Blackwell Publishers Inc., Massachusetts
42. Prescott, J.R.V. (1972): The Political Geography, Methuen, London
43. Saul Bernard Cohen, Geopolitics: The Geography of International Relations (Rowman & Littlefield, 2009)
44. Soja, E. (1989): Post-modern Geographies, Verso Press, London
45. Stuart Elden, "Land, Terrain, Territory," Progress in Human Geography 34/6 (December 2010):799 – 817
46. Stuart Elden, Terror and Territory: The Spatial Extent of Sovereignty (University of Minnesota Press, 2009)
47. Taylor, P. and Flint, C. (2000): Political Geography, Pearson Education, Harlow, Essex
48. Tuan, Y. (1977): Space and Place: The Perspective of Experience, Edward Arnold, London

DEPARTMENT OF GEOGRAPHY
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Detailed Syllabus for Second Semester of the Postgraduate Course in Geography

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 and Maximum Likelihood 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- Application of Join-Count Statistics (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: Quadrat 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*

1. Doumpos, M. and Zopounidis, C. (2004): *Multicriteria Decision Aid Classification Methods*, Kluwer Academic Publishers, New York
2. Ebdon, D. (1987): *Statistics in Geography*. Wiley.
3. Fotheringham, A.S., Brunson, C. and Charlton, M. (2007): *Quantitative Geography: Perspectives on Spatial Data Analysis*, SAGE Publications India Pvt. Ltd., New Delhi
4. Garson, G.D. (1998): *Neural Networks: An Introductory Guide for Social Scientists*, SAGE Publications, London.
5. Griffith, D.A. and Amrhein, C.G. (1997): *Multivariate Statistical Analysis for Geographers*, Prentice Hall, Upper Saddle River, New Jersey
6. John, B.G. and Pau, J. (2010): *Research Methods in Geography: A Critical Introduction*, John Wiley & Sons, UK
7. Johnston, R.J. (1978): *Multivariate Statistical Analysis in Geography: A Primer on the General Linear Model*, Longman, Harlow
8. Joseph, Jr. F.H., Black, C.W., Babin, B.J., Anderson, R.E. and Tatham, R.L. (2011): *Multivariate Data Analysis*, Pearson Prentice Hall, New Delhi
9. Khan, N. (1998): *Quantitative Methods in Geographical Research*, Concept Publishing Company, New Delhi
10. Ripley, B.D. (2004): *Spatial Statistics*, John Wiley & Sons, N.J
11. Swan, A.R.H., Sandilands, M. and McCabe, P. (1995): *Introduction to Geological Data Analysis*, Blackwell Science Ltd., Oxford
12. Waller, L. A. and Gotway, C.A. (2004): *Applied Spatial Statistics for Public Health Data*, John Wiley & Sons, New Jersey

Detailed Syllabus for Second Semester of the Postgraduate Course in Geography

Module Name: *Advanced Geoinformatics*

Paper Type: Practical

Paper Code: GEOG 0892

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

- 2.1 Concept of Remote sensing: Remote Sensing Process, Sources of Energy, Advantages and limitations of Remote Sensing [4]
- 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*

1. Albrecth, J. (2007): *Key Concepts & Techniques in GIS*, SAGE Publications Ltd., London
2. Burroughs, P.A. and McDonnell, R.A. (1998): *Principles of Geographic Information Systems*, Oxford University Press, New York
3. Campbell, J.B. and Wynne, R.H. (2011): *Introduction to Remote Sensing*, The Guilford Press, New York
4. Clark, K.C. (2010): *Getting Started with Geographic Information Systems*, Prentice Hall, Upper Saddle River, New Jersey
5. Fazal, S. (2008): *GIS Basics*, New Age International (P) Limited, Publishers, New Delhi
6. Harvey, F. (2008): *A Primer of GIS: Fundamental Geographic and Cartographic Concepts*, The Guilford Press, New York
7. Heywood, D.I., Cornelius, S. and Carver, S. (2006): *An Introduction to Geographical Information Systems*, Prentice Hall, New Jersey
8. Jensen, J.R. (006): *Remote Sensing of the Environment: An Earth Resource Perspective*, Prentice Hall, Upper Saddle River, New Jersey
9. Lillesand, T.A., Keifer, R.W. and Chipman, J.W. (2008): *Remote Sensing and Image Interpretation*, Wiley, New York
10. Longley, P.A., Goodchild, M., Maguire, D.J. Rhind, D.W. (2010): *Geographic Information Systems and Science*, Wiley, New York
11. Sabins, F.F. (2008): *Remote Sensing: Principles and Interpretation*, Waveland Press Inc., Illinois
12. Sahu, K.C. (2007): *Textbook of Remote Sensing and Geographical Information Systems*, Atlantic Publishers, New Delhi
13. Shekhar, S. and Xiong, H. (eds.) (2008): *Encyclopaedia of GIS*, Springer, New York

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)

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: 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 [8]
- 1.2 Water resources management: Evolving agricultural practices and soil conservation norms; Traditional and modern management methods in different environments; Water in the Millennium Ecosystem Assessment Framework; Freshwater Ecosystem Services [8]
- 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 [4]
- 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 [5]
- 1.5 Managing Drought: Definitions, indices and classification; Drought mapping; India's drought scenario and mitigation frameworks [4]
- 1.6 Waste water reclamation techniques and applications [3]

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

- 2.1 Hazard and Disaster: Concepts and Classifications, Frequency and Magnitude [3]
- 2.2 Hazard Exposure: Factors and Consequences; Exposure Evaluation; Hazards of Place analysis and Hazardscape zonation [4]
- 2.3 Social Capacity and Capital; Vulnerability, Resilience and Adaptability: Concepts and Indices; DROP and CDR Frameworks [5]
- 2.4 Hazard monitoring, tracking and modelling; Early warning systems and protocols; UNDRR Sendai Framework [4]
- 2.5 Applications of Geoinformatics and emerging technologies in disaster warning, mitigation and response [3]
- 2.6 Adaptations to multi-hazard scenarios: Seismic events, Tsunamis, Slope instability, Sea-level change; Using the HAZUS Model [6]
- 2.7 Emergency Sanitation/Shelters: Modalities for site selection and construction, Designing evacuation and re-settlement plans [3]
- 2.8 India's National Policy on Disaster Management; NDMA Guidelines; India Disaster Resource Network [4]

Suggested Readings: *Geo-Environmental Issues (Elective Stream I: Core Physical Geography)*

1. Alexander, D. (1993): *Natural Disasters*, ULC Press Ltd, London
2. Black, P.E. (1991): *Watershed Hydrology*, Prentice Hall, London
3. Collins, L.R. and Scheind, T.D. (2000): *Disaster Management and Preparedness*, Taylor and Francis
4. Edwards, B. (2005): *Natural Hazards*, Cambridge University Press, UK
5. Michael, A.M. (1992): *Irrigation Engineering*, Vikas Publishing House
6. Murthy, J.V.S. (1994): *Watershed Management in India*, Wiley Eastern, New Delhi
7. Murty, J.V.S. (1998): *Watershed Management*, New Age International, New Delhi
8. NDMA (2009): *National Policy on Disaster Management*, NDMA, New Delhi
9. Purandare, A.P. and Jaiswal, A.K. (1995): *Waterhed Development in India*, National Institute of Rural Development, Hyderabad
10. Sharma, R.K. & Sharma, G. (eds.) (2005): *Natural Disaster*, APH Publishing Corporation, New Delhi
11. Smith, K. (2011): *Natural Hazards*, Routledge, London
12. Vir Singh, R. (2000): *Watershed Planning and Management*, Yash Publishing House, Bikaner

DEPARTMENT OF GEOGRAPHY

PRESIDENCY UNIVERSITY

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)

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: Neo-Liberal Economic Policy

- | | |
|-----------------------------------------------------------------------------------------------------------------------|-----|
| 1.1 Neoliberalism: Meaning, emergence and historical significance; Neoliberal Economic Policy in India | [6] |
| 1.2 Growth and Social Inequality in Neoliberal India | [5] |
| 1.3 Regional Imbalance in India: Emerging spatial economic disparities | [5] |
| 1.4 Issues of Land Acquisition and SEZ: Land Acquisition Acts in India, SEZ Act, Development and Dispossession debate | [6] |

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's reproductive health: Meaning, significance, measurement and Indian situation | [5] |
| 3.3 Women Empowerment: Employment situation, Social-political participation of women | [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)*

- Ahmed, W., Peet, R. and Kundu, A. (eds.) (2011): *India's New Economic Policy: A Critical Analysis*, Rawat, New Delhi
- Banejee-Guha, S. (ed.) (2010): *Accumulation by Dispossession: Transformative Cities in the New Global Order*, Sage, New Delhi
- Chattopadhyay, A. (2013): *Poverty and Social Exclusion in India: Issues and Challenges*, Rawat Publications, Jaipur
- Kohli, A. (2012): *Poverty Amid Plenty In The New India*, Cambridge University Press, New York
- Pattanayak, U. (2008): *The Republic of Hunger and Other Essays*, Merlin Press, London
- Pattanayak, U. and Moyo, S. (2011): *The Agrarian Question in the Neoliberal Era: Primitive Accumulation and the Peasantry*, Pambazuka Press, Nairobi
- Pikety, T. Chancel, L (2017) Indian income inequality, 1922-2015: From British Raj to Billionaire Raj?, World Inequality Lab
- Sen, A. (2000): *Social Exclusion: Concept, Application and Scrutiny*, Social Development Papers No. 1, Office of Environment and Social Development, Asian Development Bank, Manila

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)

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: Hydraulics of Channel Flow

- 1.1 Classification of open channel flow, channel geometry (at-station and downstream) [4]
- 1.2 Flow continuity with special reference to St. Venant and Bernoulli equations [4]
- 1.3 Flow resistance: Traditional and physics-based approaches of measurement, Components, Limitations of Manning's Equation [4]
- 1.4 Turbulence in river flows: Definition, Turbulence boundary layers, Bed roughness and turbulence, Large scale morphologies and turbulent flows, flow obstruction [5]
- 1.6 Momentum transfer, velocity distributions and fluid shear stress and resistance [4]
- 1.7 Concept of stream power and specific energy, stream energy, roughness [2]
- 1.8 Numerical modelling in fluvial geomorphology: Reach-scale and Catchment-scale models [5]

Unit II: Channel Morphology and Pattern

- 2.1 Bedrock Channels: Controls, River incision processes; Geomorphic implications of knickpoints and potholes [3]
- 2.2 Meander development and morphology models, Classification schemes of meander bends, Depositional sequences in meanders [4]
- 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 [4]
- 2.4 Morphologies of Step-Pool and Pool-Riffle sequences: Formation, development and links with channel planform changes, streamflow hydraulics and sediment movement [2]
- 2.5 Nature and Classification of Large Woody Debris, Impact of LWDs on stream morphology and downstream channel hydraulics [2]
- 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 [5]
- 2.7 Channel avulsion: Causes, thresholds, processes and stages; Channel avulsion models; Case study of the Kosi River [3]
- 2.8 Channel Classification Schemes: Design and Purpose; Stream and Valley Classification methods after Schumm (1972), Miall (1977), Rosgen (1994) and River Styles (2000) [5]
- 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 [5]

Suggested Readings: *Streamflow Behaviour and Morphology*

1. Bridge, J. and Demico, R. (2008): *Earth Surface Processes, Landforms and Sediment Deposits*, Cambridge University Press
2. Brierley, G.J., Fryirs, K.A. (2006): *Geomorphology and River Management: Applications of the River Styles Framework*. Blackwell.
3. Carbonneau, P.E. and Piegay, H. (2012): *Fluvial Remote Sensing for Science and Management*, Wiley-Blackwell, Chichester
4. Charlton, R. (2007): *Fundamentals of Fluvial Geomorphology*, 2007
5. Chaudhury, M.H. (2008): *Open Channel Flow*, Springer
6. Dingman, S.L. (2009): *Fluvial Hydraulics*. Oxford University Press, Inc.
7. Faniran, A. and Jeje, L. K. (1983): *Humid Tropical Geomorphology*, Longman, London.
8. Fryirs, K.A. and Brierley, G.J. (2012): *Geomorphic Analysis of River Systems: An Approach to Reading the Landscape*, Wiley, New York
9. Garcia, C., Batalla, R.J. (2005): *Catchment Dynamics and River Processes*, Volume 7, In: Book Series: Developments in Earth Surface Processes, Elsevier Science
10. Habersack, H., Piegay, H., Rinaldi, M. (2005): *Gravel Bed Rivers VI: From Process Understanding to River Restoration*. Volume 11 in: In: Book Series: Developments in Earth Surface Processes, Elsevier Science
11. Hickin, E.J. (1995): *River Geomorphology*, Wiley-Blackwell, Chichester
12. Julien, P.Y. (2002): *River Mechanics*. Cambridge University Press
13. Kale, V. S. and Gupta, A. (2001): *Introduction to Geomorphology*, Orient Longman, Calcutta
14. Kondolf, G.M., Piegay, H (2003): *Tools in Fluvial Geomorphology*. John Wiley & Sons, Ltd.
15. Leopold, L. B., Wolman, M. G. and Miller, J. P. (1964): *Fluvial Processes in Geomorphology*, W.H. Freeman, San Francisco
16. Miall, A. (2014): *Fluvial Depositional Systems*, Springer, Switzerland
17. Morisawa, M. (1968): *Streams: Their Dynamics and Morphology*, McGraw-Hill
18. Richards, K. (1982): *Rivers: Form and processes in Alluvial Channels*, Methuen, London.
19. Rosgen, D. (1996): *Applied River Morphology*, Wildland Hydrology, Fort Collins, Colorado
20. Schumm, S. A. (1977): *Fluvial Systems*, Wiley, New York.
21. Sear, D.A., Newson, M.D. and Thorne, C.R. (2003): *Guidebook of Applied Fluvial Geomorphology*, (Tech. Rep. FD1914), DEFRA, London
22. Thomas, M. F. (1994): *Geomorphology in the Tropics: A study of weathering and denudation in low latitudes*, Wiley, Chichester
23. Wohl, E., (2013.): *Treatise on fluvial geomorphology*. In: Shroder, J. (Editor in Chief), Wohl, E. (Ed.), *Treatise on Geomorphology*. Academic Press, San Diego, CA, vol.9.

DEPARTMENT OF GEOGRAPHY PRESIDENCY UNIVERSITY

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)

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: Geomorphic Processes over Landscapes

- 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 and saprolite; Assessing weathering intensity [10]
- 1.2 Hillslope forms and processes: Slope elements and Soil Catena; Nine-unit land surface 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

- 2.1 Soil Formation Models: Functional-factorial model, Process-system model, Energy model, Soil evolution model, deterministic chaos and uncertainty concepts [4]
- 2.2 Profile differentiation: Eluviation-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, Techniques of Radiocarbon and Radiometric dating [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*

1. Anderson, R.S. and Anderson, S.P. (2010): *Geomorphology: The Mechanics and Chemistry of Landscapes*, Cambridge University Press, Cambridge
2. Birkeland, P. W. (1984). *Soils and geomorphology*. Oxford University Press.
3. Dixon, J. C. (2013). 4.3 Pedogenesis with Respect to Geomorphology.
4. Gerrard, A. J. (1992). *Soil geomorphology*. Springer Science & Business Media.
5. Goude, A. et al. (Eds.) (1990): *Geomorphological Techniques*. Routledge.
6. Higgitt, David L., and E. Mark Lee, eds. *Geomorphological processes and landscape change: Britain in the last 1000 years*. Vol. 69. John Wiley & Sons, 2011.
7. McCarty, L. B., Hubbard, L. R., & Quisenberry, V. L. (2016). *Applied soil physical properties, drainage, and irrigation strategies*. Springer International Publishing.
8. Migoń, P. (2013). 4.8 Weathering Mantles and Long-Term Landform Evolution.
9. Miyazaki, Tsuyoshi (2005). *Water flow in soils*. CRC Press.
10. Pope, G. (2013). Overview of Weathering and Soils Geomorphology. In *Treatise on Geomorphology* (pp. 1-11). Elsevier Inc..
11. Schaetzl, R. J., & Thompson, M. L. (2015). *Soils: Genesis and Geomorphology*. Cambridge University press.
12. Stoffel, M., Marston, R.A., (2013): Mountain and hillslope geomorphology: an introduction. In: Shroder, J. (editor in chief), Marston, R.A., Stoffel, M. (Eds.), *Treatise on Geomorphology*. Academic Press, San Diego, CA, vol.7
13. Zinck, J. A., Metternicht, G., Bocco, G., & Del Valle, H. F. (Eds.). (2015). *Geopedology: an integration of geomorphology and pedology for soil and landscape studies*. Springer.

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)

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: Regional Development

1.1 Introducing Regional Development

Timeline 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 [3]

Re-thinking on development (D.Seers, Club of Rome, Neo Marxist) [3]

1.2 Theories of Regional Development

Stage Model (Rostow and Marx) [4]

Polarized Development and Uneven Development (Perroux, Friedman, Hirschman, Myrdal); Alternative Development Models: Agropolitan Development, Import Substitution, Export-led Growth, Basic Needs Programme [8]

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 Relations, Political Violence in West Bengal, Demands of New States) [4]

Unit II: Urbanisation

2.1 Theories of Urban Planning and Urbanisation

Pioneer thinkers in urban planning (1880-1945): Anglo-American School-Howard, Wright and critiques; European School-Soria Mata, Le Corbusier and critiques [6]

Post War Planning: Barlow Commission [2]

Cities as Spaces of Production of Capital: Marx, Harvey, Castells [4]

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

Recent Theoretical Development: Ordinary City (Robinson), Planetary Urbanization (Brenner) and Informal Urbanization (Roy) [2]

2.2 Introducing the Challenges of Urban Planning

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

Cities in the Global South: Issues [2]

History, Architecture and Popular Culture [2]

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

Suggested Readings: *Concepts and Theories of Regional Development and Urbanisation*

1. Abdoumalig Simone, *For the City yet to Come: Changing African Life in Four Cities*, Duke University Press, 2004
2. Ananya Roy and Aihwa Ong (eds.), *Worlding Cities: Asian Experiments and the Art of Being Global*, Blackwell, 2011
3. Arjun Appadurai, 'Spectre of Housing in Mumbai' in *The Future as a Cultural Fact: Essays on the Global Condition*, Verso, 2013
4. Asher Ghertner, *Rule by Aesthetics: World Class City Making in Delhi*, Oxford University Press, 2015
5. Brenner, N. and Schmid, C. (2015): *Towards a new epistemology of the urban?*, *City*, 19 (2-3), 151-182
6. Carter, H. (1995): *The Study of Urban Geography*, Edward Arnold, London
7. Castells, M. (1976): *The Urban Question: A Marxist Approach*, Edward Arnold, London
8. Friedmann, J. (1986): *The world city hypothesis*, *Development and Change*, 17, 69-83
9. Friedmann, J. (1987): *Planning in the Public Domain: From Knowledge to Action*, Princeton University Press, Princeton, New Jersey
10. GautamBhan, *In the Public's Interest: evictions, Citizenship and Inequality in Contemporary Delhi*, Orient Blackswan, 2016
11. Glaeser, E. L. (2008). *Cities, Agglomeration and Spatial Equilibrium*. Oxford University Press.
12. Hall, P. (1997): *Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century*, Wiley Blackwell, New Jersey
13. Hall, P. (2002): *Urban and Regional Planning*, Routledge, London and New York
14. Hall, T. and Barrett, H. (2012): *Urban Geography*, Routledge, London and New York
15. Harvey, D. (1985). *The Urbanization of Capital*. Basil Blackwell, Oxford.
16. Hervey, D. (1978): *The Urban Process under Capitalism: A Framework for Analysis*, *International journal of Urban and Regional Research*, 2 (1-3), 101-131
17. James Holston, *The Modernist City: An Anthropological Critique of Brasilia*, University of Chicago Press, 1989
18. Janaki Nair, *Promise of the Metropolis: Bangalore's Twentieth Century*, Oxford University Press, 2005
19. Jane Jacobs, *The Life and Death of Great American Cities*, Vintage Books, 1961
20. Johnston, R.J. et al (1983): *The Dictionary of Human Geography*, Basil Blackwell Publisher Limited, Oxford
21. K C Sivaramakrishnan, *The Urban Question*, Indian Institute of Advanced Study, 1978
22. Lipton, M. (1990): *Why Poor People Stay Poor: Urban Bias in World Development*, Harvard University Press, Harvard
23. Marshall Berman, *All that is Solid Melts into Air: The Experience of Modernity*, Verso, 1983
24. Mumford, L. (1972): *The City in History: Its Origins, Its Transformations, and Its Prospects*, Harcourt Books, New York
25. Myrdal, G. (1957): *Economic Theory and Underdeveloped Regions*, Gerald Duckworth, London
26. Nezar Al Sayyad and Ananya Roy (eds.), *Urban Informality: Transnational Perspectives from the Middle East, Latin America and South Asia*, Lexington Books, 2004
27. P Thankappan Nair, *A History of Calcutta's Streets*, Firma KLM, 1987
28. Partha Chatterjee, *The Politics of the Governed*, Columbia University Press, 2006
29. Peet, R. and Thrift, N (2002). *New Models in geography: The political-economy perspective*. Unwin Hyman, London.
30. Ramchandran, R. (1997): *Urbanization and Urban Systems in India*, Oxford University Press, Oxford
31. Raza, M. and Chattopadhyay, B. (1975): *Regional Development: Analytical Framework and Indicators*, *Indian Journal of Regional Science*, Vol 1, pp. 11-34
32. Robinson, J. (2005): *Ordinary City: Between Modernity and Development*, Routledge, London and New York
33. Rostow, W.W. (1960): *Stages of Economic Growth: A Non Communist Manifesto*, Cambridge University Press, Cambridge
34. Roy, A. (2009): *Why India Cannot Plan its Cities? Informality, Insurgence and the Idiom of urbanization*, *Planning Theory*, 8 (1), 76-87
35. Sanjay Srivastava, *Entangled Urbanism: Slum, Gated Community and the Shopping Mall*, OUP, 2014
36. Sassen, S. (1991): *The global city*, Princeton University Press, Princeton
37. TapatiGuhaThakurta, *In the Name of the Goddess: The Durga Pujas of Contemporary Kolkata*, Primus, 2016
38. Venables, A. J. (2005): *Spatial disparities in developing Countries: Cities, Region and International Trade*, *Journal of Economic Geography*, 5 (1), 3-21
39. Wareing, R.K. (2004): *Social and Economic Geography Made Simple*, Rupa& Co., New Delhi
40. World Development Report (2009): *Reshaping economic Geography*, World Bank

DEPARTMENT OF GEOGRAPHY
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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: Ecological impacts of Tourism | [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- social and environmental: 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, Cape 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

1. Ateljevic, I., Pritchard, A. and Morgan, N. (2007): *The Critical Turn in Tourism Studies: Innovative Research Methodologies*, Elsevier
2. Beeton, S. (2006): *Community Development through Tourism*, Landlinks Press
3. Buckley, R. (2009): *Ecotourism: Principles and Practices*, CABI
4. Butler, R. (2006): *The Tourism Area Life Cycle* (2 vols), Channel View Publications
5. Butler, R. and Hinch, T. (2007): *Tourism and Indigenous Peoples*, Taylor and Francis
6. Cooper, C. and Hall, C.M. (2008): *Contemporary Tourism: An International Approach*, Butterworth-Heinemann
7. Cooper, C.P. (2003): *Classic Reviews in Tourism*, Channel View Publications
8. Department of Tourism (2002): National Tourism Policy, Ministry of Tourism and Culture, Govt. of India
9. Dwyer, L., Gill, A. and Seetaram, N. (2012): *Handbook of Research Methods in Tourism: Quantitative and Qualitative Approaches*, Edward Elgar
10. Faulkner, H.W., Faulkner, B., Fredline, L., Jago, L. and Cooper, C.P. (2003): *Progressing Tourism Research*, Channel View Publications
11. Fennell, D.A. and Malloy, D.C. (2007): *Codes of Ethics in Tourism: Practice, Theory, Synthesis*, Channel View Publications
12. Gössling, S. and Hall, C.M. (2006): *Tourism and Global Environmental Change: Ecological, Social, Economic and Political*
13. Hall, C.M. (2011): *Fieldwork in Tourism: Methods, Issues and Reflections*, Routledge
14. Hall, C.M. and Higham, J. (2005): *Tourism, Recreation and Climate Change*, Channel View Publications
15. Hall, C.M. and Page, S.J. (2014): *The Geography of Tourism and Recreation: Environment, Place and Space*. Taylor & Francis
16. Hall, C.M. and Tucker, H. (2004): *Tourism and Postcolonialism: Contested Discourses, Identities and Representations*, Routledge
17. Hudman, L.E. and Jackson, R.H. (2003): *Geography of Travel and Tourism*, Thomson/Delmar Learning/Interrelationships, Routledge
18. Jafari, J. (2003): *Encyclopedia of Tourism*, Routledge
19. Jansen-Verbeke, M., Priestley, G.K. and Russo, A.P. (2008): *Cultural resources for tourism: patterns, processes and policies*, Nova Science Publishers
20. Knudsen, D.C. (2008): *Landscape, Tourism, and Meaning*, Ashgate Publishing
21. Lew, A., Hall, C.M. and Timothy, D.J.. (2008): *World Geography of Travel and Tourism: A Regional Approach*, Elsevier Science.
22. Lew, A.A., Hall, C.M. and Williams, A.M. (2008): *A Companion to Tourism*, Wiley
23. Lovelock, B. (2008): *Tourism and the Consumption of Wildlife: Hunting, Shooting and Sport Fishing*, Routledge
24. Mathur, R. (2007): *International Tourism*, ABD Publishers
25. Matias, Á., Nijkamp, P. and Sarmiento, M. (2012): *Quantitative Methods in Tourism Economics*, Physica-Verlag HD.
26. Newsome, D., Dowling, R.K. and Moore, S.A. (2005): *Wildlife Tourism*, Channel View Publications
27. Pearce, D.G. and Butler, R. (1999): *Contemporary Issues in Tourism Development*, Routledge
28. Phillimore, J. and Goodson, L. (2004): *Qualitative Research in Tourism: Ontologies, Epistemologies and Methodologies*, Routledge
29. Raina, A.K. (2005): *Ecology, Wildlife and Tourism Development: Principles, Practices and Strategies*, Sarup & Sons
30. Ritchie, B.W., Burns, P and Palmer, C. (2005): *Tourism Research Methods: Integrating Theory with Practice*, CABI
31. Robinson, P., Heitmann, S. and Dieke, P.U.C. (2011): *Research Themes for Tourism*, CABI
32. Scott, D., Hall, C.M. and Gössling, S. (2012): *Tourism and Climate Change: Impacts, Adaptation and Mitigation*, Taylor and Francis
33. Scott, N., Cooper, N.S.R.B.C. and Baggio, R. (2008): *Network Analysis and Tourism*, Channel View Publications
34. Sharma, K.K. (2004): *Tourism and Regional Development*, Sarup & Sons
35. Sharma, K.K. (2005): *Tourism and Development*, Sarup & Sons
36. Spirou, C. (2011): *Urban Tourism and Urban Change: Cities in a Global Economy*, Taylor and Francis
37. Suresh, K.T. (1994): *Tourism Policy of India: An Exploratory Study*, Equations, Bangalore
38. Tribe, J. (2009): *Philosophical Issues in Tourism*. Channel View Publications
39. Wearing, S. and Neil, J. (2013): *Ecotourism*, Taylor and Francis
40. Williams, S. (2009): *Tourism Geography: A New Synthesis*, Taylor & Francis

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Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

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)

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

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 statistical 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), Base Saturation (BS) and 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
- 4.2 Hydrological Statistics: Frequency Analysis, Return Period, Probability Plotting, Extreme Value Distribution, Log-Pearson Distribution [8]
- 4.3 Flow routing methods: Level Pool, Muskingum, Series of Reservoirs [6]

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

1. Chow, V.T, Maidment, D.R and Mays, L.W. (1988): *Applied Hydrology*, McGraw Hill
2. FAO/UNESCO (1974): *Soil Map of the World, Vol. I Legend*, UNESCO, Paris
3. FAO, (1981): *A Framework for Land Evaluation*, FAO, Rome
4. FAO, (1995): *Planning for Sustainable Use of Land Resources- towards a New Approach, Land and Water Bulletin 2*, FAO, Rome
5. Subramanya, K (2013): *Engineering Hydrology*, Tata McGraw Hill, New Delhi
6. Sutherland, W.J. (eds.) (2006): *Ecological Census Techniques: A Handbook*, Cambridge University Press, New York
7. Guerit1, L. Barrier1, C. Narteau1, F. Métivier1, Y. Liu2,3, E. Lajeunesse1, E. Gayer1, P. Meunier4, L. Malverti1, and B. Ye2. The Grain-size Patchiness of Braided Gravel-Bed Streams -example of the Urumqi River (northeast Tian Shan, China) *Adv. Geosci.*, 37, 27–39, 014www.adv-geosci.net/37/27/2014/ doi:10.5194/adgeo-37-27-2014.
8. Grain Size Analysis, Grain Size Analysis; In book: *Encyclopedia of Geoarchaeology* Publisher: Springer ,Editors: Allan S. Gilbert; 2016, DOI: 10.1007/978-1-4020-4409-0_18.
9. S.M. Sengupta, *Introduction to Sedimentology* 2015.
10. Milan Vuković, Andjelko Soro Determination of hydraulic conductivity of porous media from grain-size composition; *Water Resources Publications*, 1992, ISBN 0918334772, 9780918334770.
11. *Facies Models; Response to sea Level Change* edited by R. G. Walker and N. P. James. Geological Association of Canada, 1992. No. of pages: 409. Price: \$CDN 30.00 (paperback). ISBN 0 919216 49 8. M. Williams.
12. *Sedimentary Basins; Evolution, Facies, and Sediment Budget*, Authors: Einsele, Gerhard , ISBN 978-3-662-04029-4.

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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)

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

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 with structured questionnaire schedule | [6] |
| 1.5 Group Interviews / Focus Group Discussion | [4] |
| 1.6 Participant Observations | [4] |
| 1.7 Biographical Research | [4] |
| 1.8 Ethnographic analysis | [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)*

- Berg, B.L. and Lune, H. (2012): *Qualitative Research Methods for the Social Sciences*, Pearson Education Limited, New York
- Creswell, J. W. (2009): *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, SAGE Publications, London
- Given, L. M. (2008): *The Sage Encyclopedia of Qualitative Research Methods: A-L ; Vol. 2, M-Z Index*, SAGE, London
- Grbich, C. (2004): *New Approaches in Social Research*, SAGE Publications, London
- Marvasti, A. (2003): *Qualitative Research in Sociology*, SAGE Publications, London
- Miller, J. H. and Page, S. E. (2009): *Complex Adaptive Systems: An Introduction to Computational Models of Social Life: An Introduction to Computational Models of Social Life*, Princeton University Press, Princeton
- Rihoux, B. and Ragin, C.C. (2009): *Configurational Comparative Methods: Qualitative Comparative Analysis (QCA) and Related Techniques*, SAGE Publications, London
- Shaw, I. and Gould, N. (2001): *Qualitative Research in Social Work*, SAGE Publications, London

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Detailed Syllabus for Third Semester of the Postgraduate Course in 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, Different components of Time series analysis of sediment and stream discharge [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, Drainage composition Laws, TDCN-TICN and Binary Numbering, Drainage orientation [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, clinographic model, basin asymmetry and hypsometry, tectonic indices [2]
- 2.6 Longitudinal and cross profiles of rivers: simple, normalised, SL index, concavity, curve-fits and structural relations [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: *Techniques in River Science (Elective)*

1. Carbonneau, P.E. and Piegay, H. (2012): *Fluvial Remote Sensing for Science and Management*, Wiley-Blackwell, Chichester
2. Di Baldassarre, G. (2013): *Floods in Changing Climate: Inundation Modelling*, Cambridge University Press, Cambridge
3. Monkhouse, F.J. and Williamson, R.H. (1963): *Maps and Diagrams: Their Compilation and Construction*, Methuen, London
4. Morisawa, M. (1985): *Rivers- Form and Process*, Longman Publisher Group, London
5. Morisawa, M.E. (ed.) (1971): *Quantitative Geomorphology: Some Aspects and Applications*, State University of New York, Binghamton
6. NATMO (2000): *Geomorphological Mapping*, Monograph No. 010MONO, NATMO, Kolkata
7. Pal, S.K. (1972): 'A classification of morphometric methods', *Geographical Review of India*, Vol. 34, No. 1, pp.
8. Raghunath, H.M. (2006): *Hydrology: Principles, Analysis and Design*, New Age International (P) Limited Publishers, New Delhi
9. Sarkar, A. (2008): *Practical Geography: A Systematic Approach*, Orient BlackSwan, Kolkata
10. Sen, P.K. (1993): *Geomorphological Analysis of Drainage Basins*, The University of Burdwan, Burdwan
11. Strahler, A (1957) 'Quantitative analysis of watershed geomorphology', *Transactions of the American Geophysical Union*, 38(6): 913-920
12. Suresh, M., Sudhakar, S., Tiwari, K.N. and Chowdary, V.M. (2004): 'Prioritisation of watersheds using morphometric parameters and assessment of surface water potential using Remote Sensing', *Journal of the Indian Society of Remote Sensing*, 32(3): 249 - 259
13. Wilson, J.P. and Gallant, J.C. (ed.) (2000): *Terrain Analysis- Principles and Applications*, Wiley, New York, pp. 479
14. Wood, J. (1996b): *The geomorphological characterisation of digital elevation models*, Unpublished Ph.D. Thesis, University of Leicester

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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)

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

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)*

1. Agarwal, B.L. (1988): *Basic Statistics*, New Age International Publisher, New Delhi
2. Anjaneyulu, Y., & Manickam, V. (2011). *Environmental impact assessment methodologies*. BS Publications
3. Cole, J.P and King, C.A.M. (1970): *Quantitative Geography*, John Wiley and Sons, New York
4. Croxton, F.E. and Cowden, D.J. (1939): *Applied General Statistics*, Prentice Hall, New Jersey
5. Dickinson, G.C. (1973): *Statistical mapping and the presentation of statistics*, Edward Arnold, London
6. Hadley, G. (1977): *Linear Algebra*, Addison-Wesley Publishing Company, Boston
7. Healy, F.J., (2010): *Statistics: A tool for Social Research*, Cengage Learning, New York
8. Kundu, A. (1980): *Measurement of urban processes: A study in Regionalization*, Popular Prakashan, New Delhi
9. Rogerson, P. (2001): *Statistical Methods for Geography*, Sage Publications, London

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Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

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 I: 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 II: 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 III: 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 Metrics) [4]
- 3.4 Growth Prediction: Integration of CA-Markov Model, Artificial Neural Network (ANN) [6]

Unit IV: Environment and Urbanization

- 4.1 Urban Ecosystem Service Assessment. [4]
- 4.2 Livability Assessment: 'K'-means cluster analysis and Entropy. [6]

Unit V: Infrastructure, Basic Services and Finance

- 5.1 Assessment of Splintered Urbanism: AccesstoPotableDrinking water [4]
- 5.2 Housing demand analysis: Hedonic price model [4]

Suggested Readings: *Techniques in Regional and Urban Analysis*

1. Agarwal, B.L. (1988): Basic Statistics, New Age International Publisher, New Delhi
2. Cole, J.P and King, C.A.M. (1970): Quantitative Geography, John Wiley and Sons, New York
3. Croxton, F.E. and Cowden, D.J. (1939): Applied General Statistics, Prentice Hall, New Jersey
4. Dickinson, G.C. (1973): Statistical mapping and the presentation of statistics, Edward Arnold, London
5. Hadley, G. (1977): Linear Algebra, Addison-Wesley Publishing Company, Boston
6. Healy, F.J., (2010): Statistics: A tool for Social Research, Cengage Learning, New York
7. Kundu, A. (1980): Measurement of urban processes: A study in Regionalization, Popular Prakashan, New Delhi
8. Rogerson, P. (2001): Statistical Methods for Geography, Sage Publications, London

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Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

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 I: Social Indicators of development and Community development

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 1.1 Compositing indices: Problems of synthesising large size data into smaller dimensions; Choice of variables in construction of indicators, weightage and ranking method, Range equalisation techniques | [4] |
| 1.2 Social Indicators: Selection 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 II: Methods in Tourism Geography

- | | |
|-------------------------------------------------------------------------------------------------|-----|
| 2.1 Designing of 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 III: Measuring Agricultural Development

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 3.1 Methods of 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 production, yield and area under 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-Purchase behavior of agricultural inputs; Farmers' marketing practices- Regulated markets and its role in marketing of farm produce | [10] |

Suggested Readings: *Methods in Developmental Geographies*

- Chandra Shekara, P., & et al (2016): *Farmer's Handbook on Basic Agriculture*, Desai Fruits & Vegetables Pvt. Ltd. Navsari, Gujarat
- Crop Production Guide (2005): Directorate of Agriculture, Govt. Of West Bengal
- Freudenberge K. S., *Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA)-A manual for CRS field works and partners*, Maryland.
- ICAR. (2006): *Handbook of Agriculture. Indian Council of Agricultural Research*, New Delhi.
- Kahlon A.S. and S.D.Tyagi, (2000): *Agricultural Price Policy in India*, Allied Publishers Pvt. Ltd., Bombay.
- Kundu, A. (1980): *Measurement of urban processes: A study in Regionalization*, Popular Prakashan, New Delhi
- Rogerson, P. (2001): *Statistical Methods for Geography*, Sage Publications, London
- Sadanandan S., Natarajan P., et al (2007): *Data Tools: Participatory Rural Appraisal Techniques*, Cochin.
- Sivarama Prasad A., (1999): *Agricultural Marketing in India*, Mittal Publications, New Delhi.

DEPARTMENT OF GEOGRAPHY
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Detailed Syllabus for Third Semester of the Postgraduate Course in Geography

Module Name: *Dissertation Methods*

Paper Type: Practical

Paper Code: GEOG 0993

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
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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

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)

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: 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, formational 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 palaeoclimate imprints; Case studies of Chotonagpur 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)

1. Aleva, G.J.J. (1994): Laterites: concepts, geology, morphology and chemistry. International Soil Reference and Information Centre
2. Bagchi, K.N., Munshi, S.K. & Bhattacharya, R (Ed.) (1972): The Bhagarathi Hooghly Basin, Proceedings of the Interdisciplinary Symposium, Department of Geography, Calcutta University
3. Biswas, A. (1987): Laterites and lateritoids of Rarh Bengal. In: datye, V. S. et al. (Ed.). Explorations in the Tropics. Prof. KD Dikshit Felicitation Volume Committee, 48-54.
4. Biswas, B. (1959): Surface Geology of West Bengal, India. Proc. Dev. Petrol., Res. ECAFE, Min. Res. Dev. Ser.No. 10.
5. Culver H.E. (2015): The Formation of Laterite. Palala Press
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
7. Jackson, NL. (2013): Estuaries. In: John F. Shroder (ed.) Treatise on Geomorphology, Volume 10, pp. 308-327. San Diego: Academic Press.
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).
10. Kennish, M.J. (ed.) (2016): Encyclopedia of Estuaries. Springer, Dordrecht.
11. Liviu GiosanJanok P. Bhattacharya.2005 River Deltas–Concepts, Models, And Examples. SEPM Society For Sedimentary Geology,Volume-83,DOI: <https://doi.org/10.2110/Pec.05.83> ,ISBN Electronic:9781565762190.
12. Mcfarlane, M. J. (1986): Geomorphological analysis of laterites and its role in prospecting geological survey of India. Memoirs. Laterization Processes. v. 120, 41-50.
13. McGetchin, T.R., Burke, K.C., Thompson, G.A., Young, R.A. (2013): Mode and Mechanisms of Plateau Uplifts. Geodynamics Series, 99–110. DOI: 10.1029/gd001p0099
14. Mukhopadhyay S.C. (1968): Erosion surfaces of the Sanjay River Valley, The Subarnarekha System, Bihar, IGU, S-25, Ranchi University
15. ofcanada, 317 p.
16. Pope G.A. (2013): Weathering in the Tropics, and Related Extratropical Processes. In: John F. Shroder (ed.) Treatise on Geomorphology, Volume 4, pp. 179-196. San Diego: Academic Press.
17. Richards, K. (1978): *Fluvial Geomorphology*, Blackwell, London
18. Rudra, Kalyan, 2018Rivers Of The Ganga-Brahmaputra-Meghna Delta A Fluvial Account Of Bengal, ISBN 978-3-319-76544-0.
19. Sengupta, S. (1966): Geological and Geophysical studies of the Western part of Bengal Basin, India, Bull. Ammer. Assoc. Petrol Geologist, Vol. 50, pp. 1001-1017
20. Sherman, D.J., (2013): Perspectives on coastal geomorphology: introduction. In: Shroder, J. (Editor in Chief), Sherman, D.J. (Ed.), Treatise on Geomorphology. Academic Press, San Diego, CA, vol. 10
21. T. Elliott, Chapter 6 Deltas.
22. Technical Report No. 424,1985,Deltaic Morphology And Sedimentology With Special Reference To The Indus River Delta J. T. Wells And J. M. Coleman .
23. Vörösmarty, c.j., sharma, k.p., balázs, m.f., copeland, a.h., holden, j.,marble, j., and lough, j.a., 1997, the storage and aging of continental runoff in large reservoir systems of the world: ambio, v. 26, p. 210–219.
24. Walker, r.g., 1984. Facies models, second edition: geological association
25. Walker, r.g., 1992, facies, facies models and modern stratigraphic concepts, *in* walker, r.g., and james, n.p., eds., facies models: response to sea level change: geological association of canada, p. 1–14.
26. 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.
27. 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:
28. Wolanski, E., Elliot M. (2016): Estuarine Ecohydrology- An Introduction. Elsevier, Amsterdam.
29. Spencer, T., Moller, I. (2013) Mangrove Systems. In: John F. Shroder (ed.) Treatise on Geomorphology, Volume 10, pp. 361-391. San Diego: Academic Press.

DEPARTMENT OF GEOGRAPHY
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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)

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 : 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: Sustainable Development Goals 2030; Poverty and SDGs; Relative poverty and inequalities at a global scale; Current Debates around SDGs; Alternative Development: Civil Society, Social Capital and Non-Governmental Organisations [12]

Unit II : Political Economy

- 2.1 Theory of state, politics and economics: The Rise of Modern World Economy: Hegemony and Machiavellianism; Contemporary International Politics: Marxism and Critical Views; Globalization and Multinational Corporations: Capitalism; Welfare States, International Trade, Social Contract, Pluralism [20]
- 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; Role of political economy upon structure and function of democracy [12]

Suggested Readings: *Geography of Development and Political Economy*

1. Acemoglu, D. and Robinson, J. (2013): *Why Nations Fail: The Origin of Power, Prosperity and Poverty*, Crown, London
2. Berlin, Isaiah. "Two Concepts of Liberty." In *Four Essays on Liberty*. New York, Oxford University Press, 1990.
3. Cohn, Theodore – *Global Political Economy: Theory and Practice*.
4. Easterly, W. (2014): *The Tyranny of Experts: Economists, Experts and Forgotten Rights of the Poor*, Basic Books, New York
5. Friedman, Milton. *Capitalism and Freedom*. Chicago, IL: University of Chicago Press, 1982, pp. 1-55, 108-37, and 161-90.
6. Gill, Stephen – *Power and Resistance in the New World Order*.
7. Gilpin, Robert – *Global Political Economy*
8. Graham Bannock, R.E. Baxter, and Evan Davis, *The Penguin Dictionary of Economics*, Eighth edition (New York: Penguin, 2011).
9. Howard, M. C., and J. E. King. *The Political Economy of Marx*. New York, NY: New York University Press, 1988, pp. 1-180.
10. Jeffrey Frieden, David Lake, and Lawrence Broz, Editors, *International Political Economy: Perspectives on Global Power and Wealth*, Fifth Edition (New York: W. W. Norton, 2010).
11. Machiavelli, *The Prince*
12. Pieterse, J. N. (2010). *Development Theory*. Sage, Los Angeles.
13. Polanyi, Karl. Chapters 3-14 in *The Great Transformation: The Political and Economic Origins of Our Time*. Boston, MA: Beacon Press, 2001.
14. Potter, R., Binns, T., Smith, D.W. and Elliott, J. (2008): *Geographies of Development: An Introduction to Development Studies*, Prentice Hall, New York
15. Potter, R., Conway, D., Evans, R and Lloyd-Evans, S. (2012). *Key Concepts in Development Geography*. Sage, Los Angeles.
16. Randy Charles Epping, *A Beginner's Guide to the World Economy*, Third Edition (New York: Vintage, 2001).
17. Ravenhill, John – *Global Political Economy*.
18. Samuelson, P.A. (ed.) (1948): *Economics: An Introductory Analysis*, McGraw-Hill, London
19. Thomas Oatley, *International Political Economy: Interests and Institutions in the Global Economy*, Fifth Edition (New York: Pearson Longman, 2012).
20. Weber, Max. Introduction and chapters 1-3, and 5 in *The Protestant Ethic and the Spirit of Capitalism*, 2010.
21. Williams, G., Meth, P. and Willis, K. (2009): *Geographies of Developing Areas: The global south in a changing world*, Routledge, London
22. Yusuf, S. (2009): *Development Economics through the Decades: A Critical Look at 30 Years of the World Development Report*, World Bank, Washington D.C.

DEPARTMENT OF GEOGRAPHY
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Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

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)

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: 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 [5]
- 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 [3]
- 1.4 Channel initiation and network development: models and mechanisms [3]
- 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 [3]
- 1.6 Slope-catchment influence on sediment transfer and river channel morphology; Components of the sediment cascade [2]
- 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 [8]
- 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 [3]
- 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 [5]

Unit II: Sediment Flux

- 2.1 Processes of erosion in alluvial channels [4]
- 2.2 Critical shear stress: Definition and Estimation, Sediment entrainment and transport, Armour formation [6]
- 2.3 Bed parameters and sediment motion; Flow turbulence and sediment motion [6]
- 2.4 Sediment transport rate; Sediment sorting and orientation during erosion and deposition [6]
- 2.5 Suspended load: Suspension of cohesive and non-cohesive sediment- Effect of size and stratification [3]
- 2.6 Bedload: Characteristics, Grain Kinematics, Eulerian approach of measuring bedload transport rates [4]
- 2.7 Effect of sediment transport on flow characteristics [6]

Suggested Readings: *Sediment in the Fluvial System*

1. Boggs, S. Jr. (2006): *Principles of Sedimentology and Stratigraphy*, Prentice Hall, Upper Saddle River, New Jersey
2. Fryirs, K.A. and Brierley, G.J. (2012): *Geomorphic Analysis of River Systems: An Approach to Reading the Landscape*, Wiley, New York
3. Gilbert, G.K. (1914): *The Transportation of Debris by Running Water*, USGS Professional Paper No. 86, USGS, Denver
4. Gutierrez, M. (2013): *Geomorphology*, CRC Press, BocaRanton, Florida
5. Knighton, D. (1998): *Fluvial Forms and Processes- A New Perspective*, Routledge, London
6. Perry, C. and Taylor, K. (2007): *Environmental Sedimentology*, Blackwell Publishing, Oxford
7. Petts, G.E. and Amoros, C. (eds.) (1996): *Fluvial Hydrosystems*, Chapman and Hall, London
8. Summerfield, M.A. (1991): *Global Geomorphology: An Introduction to the Study of Landforms*, Longman, London
9. Thornbury, W. D. (1960): *Principles of Geomorphology*, John Wiley & Sons, New York
10. Young, A. (1972): *Slopes*, Oliver and Boyd, Edinburgh

DEPARTMENT OF GEOGRAPHY
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Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

Module Name: *Assessing Landscape and Water Quality*

(Special Paper for Elective Stream I: Option B - Physical Basis of Landscape Management)

Paper Type: Theory

Paper Code: GEOG 1002A2

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]
- 1.2 Assessing Visual and Social Perception of Landscape: Principles and Definitions, The Study of Visual and Multi-Sensorial Perception, The Study of Social Perception, The Scenic Value of Landscapes and the relevant indicators, The Social Value of Landscapes and the relevant indicators [7]
- 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

1. Allen, L., Christian-Smith, J., &Palaniappan, M. (2010). Overview of greywater reuse: the potential of greywater systems to aid sustainable water management. *Pacific Institute*, 654, 19-21
2. Anjaneyulu, Y., &Manickam, V. (2011). *Environmental impact assessment methodologies*. BS Publications.
3. Blears, W. F. (2016). *Soil and environmental chemistry*. Academic Press.
4. Craswell, E., Bonnell, M., Bossio, D., Demuth, S., & van de Giesen, N. (Eds.). (2007). *Integrated assessment of water resources and global change: a north-south analysis*. Springer Science & Business Media.
5. Dinar, A., & Subramanian, A. (1997). *Water pricing experiences: An international perspective*. The World Bank.
6. Dixon, A. M., Butler, D., &Fewkes, A. (1999). Guidelines for greywater re-use: health issues. *Water and Environment Journal*, 13(5), 322-326.
7. Fricke, K. (2013). *Analysis and Modelling of Water Supply and Demand Under Climate Change, Land Use Transformation and Socio-Economic Development: The Water Resource Challenge and Adaptation Measures for Urumqi Region, Northwest China*. Springer Science & Business Media.
8. Goel, P. K. (2006). *Water pollution: causes, effects and control*. New Age International.
9. Hoekstra, A. Y., Chapagain, A. K., Mekonnen, M. M., &Aldaya, M. M. (2011). *The water footprint assessment manual: Setting the global standard*. Routledge.
10. Hülsmann, S., &Ardakanian, R. (Eds.). (2018). *Managing Water, Soil and Waste Resources to Achieve Sustainable Development Goals: Monitoring and Implementation of Integrated Resources Management*. Springer.
11. Jeppesen, B. (1996). Domestic greywater re-use: Australia's challenge for the future. *Desalination*, 106(1-3), 311-315.
12. Jørgensen, S. E., Xu, L., &Costanza, R. (Eds.). (2016). *Handbook of ecological indicators for assessment of ecosystem health*. CRC press.
13. Kapustka, L. A., & Landis, W. G. (Eds.). (2010). *Environmental risk assessment and management from a landscape perspective*. John Wiley & Sons.
14. Mareddy, A. R., Shah, A., &Davergave, N. (2017). *Environmental impact assessment: theory and practice*. Butterworth-Heinemann.
15. Moncur, J. E. (1987). Urban water pricing and drought management. *Water Resources Research*, 23(3), 393-398.
16. Nolde, E. (2005). Greywater recycling systems in Germany—results, experiences and guidelines. *Water Science and Technology*, 51(10), 203-210.
17. Patnaik, P. (2010). *Handbook of environmental analysis: chemical pollutants in air, water, soil, and solid wastes*. Crc Press.
18. Peano, A. (2011). *Landscape Indicators: Assessing and Monitoring Landscape Quality*. Springer Verlag.
19. Pereira, T. (2009). Sustainability: An integral engineering design approach. *Renewable and Sustainable Energy Reviews*, 13(5), 1133-1137.
20. Pierce, F. J. (1998). *Advances in soil and water conservation*. CRC Press.
21. Plieninger, T., &Bieling, C. (Eds.). (2012). *Resilience and the cultural landscape: understanding and managing change in human-shaped environments*. Cambridge University Press.
22. Raftelis, G. A. (2014). *Water and Wastewater Finance and Pricing: The Changing Landscape*. CRC Press.
23. Roy, U., &Majumder, M. (2015). *Vulnerability of Watersheds to Climate Change Assessed by Neural Network and Analytical Hierarchy Process*. Springer.
24. Theodore, L., &Dupont, R. R. (2012). *Environmental health and hazard risk assessment: Principles and calculations*. CRC Press.
25. Tyagi, S., Sharma, B., Singh, P., &Dobhal, R. (2013). Water quality assessment in terms of water quality index. *American Journal of Water Resources*, 1(3), 34-38.
26. Viessman, W., Hammer, M. J., Perez, E. M., &Chadik, P. A. (1998). *Water supply and pollution control*.
27. Zhang, L., &Schwärzel, K. (Eds.). (2017). *Multifunctional Land-Use Systems for Managing the Nexus of Environmental Resources*. Springer.

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 Urban Place-making; Suburbanisation; Challenges for today's planners [2]
- 1.2 Healthy Urban 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 the Sustainable City

- 4.1 Types of Urban Plans in India: Master Plan/Development Plan, Transportation Plan; Strategic Plan; City Development Plan, Area Development Plan [4]
- 4.2 National Urban Policy Framework, 2018 [2]
- 4.3 Land management for planning: Land Acquisition and Land Pooling Model, TDR, FSI, FAR [4]
- 4.4 Cities' Future: New Town, Smart Growth/Compact City, Green City and Urban Agriculture, Resilient City, Liveability [4]

Unit V: Implementing the changes

- 5.1 UN Global Cities Compact: United Cities and Local Governments (UCLG) [2]
- 5.2 International Council for Local Environmental Initiatives (ICLEI) [4]
- 5.3 UN-Habitat and International Development and Financing agencies [4]
- 5.4 Urban innovation: Role of community-based organisations and civil society [3]

Suggested Readings: *Sustainable Urban Development*

1. Allen, Adriana. "Environmental planning and management of the peri-urban interface: perspectives on an emerging field." *Environment and urbanization* 15.1 (2003): 135-148.
2. An interactive Display of Global Cities of the Future by McKinsey&Company
3. Cities-engines of Economic Development 2005, United Nations Human Settlements Programme (UN-Habitat)
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
6. Head, Peter (2016) "Implementing the Global Goals in City Regions", *Urbanisation*, Vol 1, Issue 1, pp. 19 - 30.
7. International guidelines on urban and territorial planning, UN Habitat, 2015
8. LSE Cities : New Urban Governance - Urban complexity and institutional capacities of cities - Data and Publications
9. Roy, Ananya. Why India cannot plan its cities: Informality, insurgency and the idiom of urbanization. *Planning Theory* 8.1 (2009): 76-87
10. World Bank on Urban Water
11. World Bank. 2013. Urban Agriculture : Findings from Four City Case Studies. Urban Development Series Knowledge Papers;No. 18. Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/16273> License: CC BY 3.0 IGO.
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

DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

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 (after D.M. Smith); 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 a basic human right; Dimensions of housing and social wellbeing; Housing problems in India; Government policies on affordable housing [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; Spatiality 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*

1. Behera, D. K., Pfeffer, G., (eds) (1999): *Contemporary Society: Tribal Studies*, Vol- III, Concept Publishing Company, New Delhi.
2. Chaudhuri, B., (ed.) (1992): *Socio-Economic and Ecological Development*, Inter-India Publications, New Delhi.
3. Das, B. K., Das R.K., (eds) (2017): *Rethinking Tribe in Indian Context*, Rawat Publications, Jaipur.
4. Dasgupta, P. (1993): *An enquiry into wellbeing and destitution*, Oxford University Press, New York
5. Desai, Vandana and Robert B. Potter eds(2008) *The Companion to Development Studies*.Routledge.
6. Freudenberge K. S., *Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA)-A manual for CRS field works and partners*, Maryland.
7. Friedman, M. (1962): *Capitalism and Freedom*, University Press, Chicago
8. Harvey, D. (1973): *Social Justice and the City*, Edward Arnold, London
9. Narayan, S. (2002): *The Dynamics of Tribals Development- Issues and Challenges*, Gyan Publishing House, Delhi.
10. Nathan, D., Xaxa, V., (eds) (2017): *Social Exclusion and Adverse Inclusion-Development and Deprivation of Adivasis in India*, Oxford Press.
11. Peet, R., Hartwick, E. (2015) *Theories of Development*, Third Edition, Guilford Press
12. Pfeffer, G., Behera, D. K. (eds) (1997): *Contemporary Society: Tribal Studies*, Vol-II, Concept Publishing Company, New Delhi.
13. Potter, R.,et. all (2017) *Geographies of Development*. London: Routledge.
14. Raha M. K., Coomar P. C. (eds) (1989): *Tribal India: Problem development Prospect*. Vol- I & II, Gian Publishing House, New Delhi.
15. Rath, G.C (ed.) (2006): *Tribal Development in India- The Contemporary Debate*, Sage Publications, New Delhi.
16. Rose, H.M. (1971): *The Black Ghetto: A Spatial Behavioral Perspective*, McGraw Hill, New York
17. Roy, K. (ed.) (2008): *Education and Health Problems in Tribal Development- A Study of National Integration*, Concept Publishing Company, New Delhi.
18. Sadanandan S., Natarajan P., et al (2007): *Data Tools: Participatory Rural Appraisal Techniques*, Cochin.
19. Smith D. M. (1973): *The geography of social well-being in the United States: an introduction to territorial social indicators*, McGraw-Hill,London
20. Smith D. M. (1977): *Human geography: A welfare approach*, St. Martin's Press, London
21. Smith D. M. (1979): *Where the Grass is Greener: Geographical Perspectives on Inequality*, Croom Helm, London
22. Smith, N. (2010) *Uneven Development: Nature, Capital, and the Production of Space*, University of Georgia Press
23. Tripathy S.N., (2013): *Tribal Development-Issues and Policy Options*, Abhijeet Publications, New Delhi.

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

Paper Code: GEOG 1003A1

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: River Landscape Components

- 1.1 Drainage Basin Evolution: the ergodic hypothesis and physical simulation [2]
- 1.2 River terraces: Types and formation mechanisms; Typical characteristics of strath and fill terraces with respective facies models; Interpretating terrace chronology with implications for climate-tectonic forcing; Case Studies from Garhwal or Sikkim [7]
- 1.3 Alluvial fans: Boundary conditions for formation; Origin and growth processes and models of fan evolution; Alluvial 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 [7]
- 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 [9]
- 1.5 In-stream geomorphic units: Types (sculpted coarse and fine-grained, mid-channel, bank-attached features) and their form-process interpretations [4]
- 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 [5]

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; Stream Functions Pyramid: Components, measures and assessment methods [5]
- 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) [6]
- 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 [4]
- 2.4 Hyporheic Exchange Flows: Importance, Controlling factors, Variations along channel types and across channel geomorphic units, Nature of losing and gaining reaches [3]
- 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 [6]
- 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 [6]

Suggested Readings: *Riverine Landscape Components and Management*

1. Brierley, G.J., Fryirs, K.A. (2006): *Geomorphology and River Management Applications of the River Styles Framework*. Blackwell Publishing.
2. Butler, DR., Hupp, CR (2013.): Treatise on fluvial geomorphology. In: Shroder, J. (Editor in Chief), Wohl, E. (Ed.), *Treatise on Geomorphology*. Academic Press, San Diego, CA, vol. 12.
3. Gupta. A. (ed.) (2007): *Large Rivers: Geomorphology and Management*. John Wiley & Sons Ltd.
4. Morisawa, M.E. (ed.) (1977): *Fluvial Geomorphology*, State University of New York (Binghamton), New York, pp. 9 - 21
5. Richards, K. (1978): *Fluvial Geomorphology*, Blackwell, London
6. Saha, S. K. and Barrow, C. J. (1981): *River Basin Planning: Theory and Practice*, Wiley, Chichester
7. Wohl, E., (2013.): *Treatise on fluvial geomorphology*. In: Shroder, J. (Editor in Chief), Wohl, E. (Ed.), *Treatise on Geomorphology*. Academic Press, San Diego, CA, vol.9.
8. Fryirs, K.A., Brierley, G.J. (2013): *Geomorphic Analysis of River Systems*. Wiley-Blackwell, Chichester

DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

Module Name: *Integrated Landscape and Water Management*

(Special Paper for Elective Stream I: Option B - Physical Basis of Landscape Management)

Paper Type: Theory

Paper Code: GEOG 1003A2

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 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: Ecocentric approach for managing complex landscapes; Conservation biology and ecosystem management [4]
- 3.2 Landscape Management using Green Infrastructure Practices: Bioswales; Permeable pavements; Green roofs, Urban Tree canopy [4]
- 3.3 Water Harvesting and Conservation: Water harvesting techniques, Micro catchments, Design of small water harvesting structures, Urban Futures: delivering water sensitive cities [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*

1. Abi Aad, M. P., Suidan, M. T., & Shuster, W. D. (2009). Modeling techniques of best management practices: Rain barrels and rain gardens using EPA SWMM-5. *Journal of Hydrologic Engineering*, 15(6), 434-443.
2. Anděl, J., Bičík, I., Dostál, P., Lipský, Z., & Shahneshin, S. G. (Eds.). (2010). *Landscape Modelling: Geographical Space, Transformation and Future Scenarios* (Vol. 8). Springer Science & Business Media.
3. Anděl, J., Bičík, I., Dostál, P., Lipský, Z., & Shahneshin, S. G. (Eds.). (2010). *Landscape Modelling: Geographical Space, Transformation and Future Scenarios* (Vol. 8). Springer Science & Business Media.
4. Andersson, E., Barthel, S., Borgström, S., Colding, J., Elmqvist, T., Folke, C., & Gren, Å. (2014). Reconnecting cities to the biosphere: stewardship of green infrastructure and urban ecosystem services. *Ambio*, 43(4), 445-453.
5. Banks, S. C., Cary, G. J., Smith, A. L., Davies, I. D., Driscoll, D. A., Gill, A. M., ... & Peakall, R. (2013). How does ecological disturbance influence genetic diversity?. *Trends in ecology & evolution*, 28(11), 670-679.
6. Baudry, J., Zonneveld, I. S., & Forman, R. T. (1990). *Changing landscapes: an ecological perspective*. Springer.
7. Bennett, A. F., & Saunders, D. A. (2010). Habitat fragmentation and landscape change. *Conservation biology for all*, 93, 1544-1550.
8. Cantrell, B. E., & Holzman, J. (2015). *Responsive landscapes: strategies for responsive technologies in landscape architecture*. Routledge.
9. Costanza, R., & Voinov, A. (Eds.). (2003). *Landscape simulation modeling: a spatially explicit, dynamic approach*. Springer Science & Business Media.
10. Coutts, A. M., Tapper, N. J., Beringer, J., Loughnan, M., & Demuzere, M. (2013). Watering our cities: The capacity for Water Sensitive Urban Design to support urban cooling and improve human thermal comfort in the Australian context. *Progress in Physical Geography*, 37(1), 2-28.
11. Echols, S. (2007). Artful rainwater design in the urban landscape. *Journal of Green Building*, 2(4), 101-122.
12. Fall, A., & Fall, J. (2001). A domain-specific language for models of landscape dynamics. *Ecological modelling*, 141(1-3), 1-18.
13. Foster, D. R., Knight, D. H., & Franklin, J. F. (1998). Landscape patterns and legacies resulting from large, infrequent forest disturbances. *Ecosystems*, 1(6), 497-510.
14. Fischer, J., & Lindenmayer, D. B. (2007). Landscape modification and habitat fragmentation: a synthesis. *Global ecology and biogeography*, 16(3), 265-280.
15. Gergel, S. E., & Turner, M. G. (Eds.). (2017). *Learning landscape ecology: a practical guide to concepts and techniques*. Springer.
16. Hansson, L., Fahrig, L., & Merriam, G. (Eds.). (1994). *Mosaic landscapes and ecological processes* (Vol. 2). Springer Science & Business Media.
17. Holden, J. (Ed.). (2005). *An introduction to physical geography and the environment*. Pearson Education.
18. Johnson, G. D., & Patil, G. P. (2007). *Landscape pattern analysis for assessing ecosystem condition* (Vol. 1). Springer Science & Business Media.
19. Jørgensen, S. E., Xu, L., & Costanza, R. (Eds.). (2016). *Handbook of ecological indicators for assessment of ecosystem health*. CRC press.
20. Keane, R. E., Cary, G. J., Davies, I. D., Flannigan, M. D., Gardner, R. H., Lavorel, S., ... & Rupp, T. S. (2004). A classification of landscape fire succession models: spatial simulations of fire and vegetation dynamics. *Ecological modelling*, 179(1), 3-27.
21. Lindenmayer, D. B., & Fischer, J. (2013). *Habitat fragmentation and landscape change: an ecological and conservation synthesis*. Island Press.
22. Lopez, R. D. (2017). *Remote Sensing for Landscape Ecology*. CRC Press.
23. Manel, S., & Holderegger, R. (2013). Ten years of landscape genetics. *Trends in ecology & evolution*, 28(10), 614-621.
24. McCarty, L. B., Hubbard, L. R., & Quisenberry, V. L. (2016). *Applied soil physical properties, drainage, and irrigation strategies*. Springer International Publishing.
25. Mell, I. C. (2008, June). Green infrastructure: concepts and planning. In *FORUM ejournal* (Vol. 8, No. 1, pp. 69-80).
26. Mladenoff, D. J. (2004). LANDIS and forest landscape models. *Ecological modelling*, 180(1), 7-19.
27. Newell, J. P., Seymour, M., Yee, T., Renteria, J., Longcore, T., Wolch, J. R., & Shishkovsky, A. (2013). Green Alley Programs: Planning for a sustainable urban infrastructure?. *Cities*, 31, 144-155.
28. Netusil, N. R., Levin, Z., Shandas, V., & Hart, T. (2014). Valuing green infrastructure in Portland, Oregon. *Landscape and Urban Planning*, 124, 14-21.
29. Turner, M. G., Gardner, R. H., O'Neill, R. V., & O'Neill, R. V. (2001). *Landscape ecology in theory and practice* (Vol. 401). New York: Springer.
30. Sutton, R. K. (1991). CHANGING LANDSCAPES: AN ECOLOGICAL PERSPECTIVE. *Landscape Journal*, 10(1), 81-82.
31. Ward, J. (1998). Riverine landscapes: biodiversity patterns, disturbance regimes, and aquatic conservation. *Biological conservation*, 83(3), 269-278.

DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

Module Name: *Urban Governance, Infrastructure and Development*

(Special Paper for Elective Stream II: Option A - Regional Development and Urban Studies)

Paper Type: Theory

Paper Code: GEOG 1003B1

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: Urbanization, Urban Growth and Urban Restructuring

- 1.1 Stages of urban development: Klaassen et al. and Berg et al.; Urbanisation Cycle [4]
- 1.2 Contemporary thesis of urbanization in South Asia: Unregulated Growth, Exclusionary Urbanization, Polarization Reversal, Extended Metropolis, Ruralopolis, Subaltern Urbanization [6]

Unit II: 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 Basic Urban Services: Water and sanitation [3]
- 2.3 Sources of municipal revenue and fields of expenditure; Municipal budget analysis (Decentralization Index and devolution index) [4]
- 2.4 Financing Infrastructure and basic services: Traditional and innovative financing [3]

Unit III: Urban Housing and Neighborhood Change

- 3.1 Urban housing policies in India [2]
- 3.2 Housing submarkets in India [2]
- 3.3 Residential Mobility: Concept and theories (Rossi, Turner and Edwards) [4]
- 3.4 Neighbourhood Change: Concept and models (Downs and Bourne) [4]
- 3.5 Residential segregation: Concept and theories (Spatial Assimilation and Spatial Stratification Theory) [4]

Unit IV: Issues of Urban Sustainability

- 4.1 SDGs: Measuring and Monitoring [4]
- 4.2 Sustainable services: Infrastructure and Transport Planning [4]
- 4.3 Case study: Sendai Framework for Disaster Risk Reduction 2015-2030 [4]

Unit V: 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*

1. Aijaz, R. (2008): Form of Urban Local Government in India, *Journal of Asian and African Studies*, 43 (2), 131-154
2. Arabi, U., Musthaf and Nagendra (2007): Urban Housing Policies in India: Strategies and Issues, *Nagarlok*, 39 (2), 32-60
3. Baud, I. S. A. and de Wit, J. (2008): *New Forms of Urban Governance in India: Shifts, Models, Networks and Contestations*, Sage Publication, New Delhi
4. Das, A. K. (2007): *Urban Planning in India*, Rawat Publication, New Delhi
5. Denis, E. and Zérah, M. H. (2017). *Subaltern Urbanisation in India: An Introduction to the Dynamics of Ordinary Towns*, Springer, New York.
6. Denis, E., Mukhopadhyay, P. and Zerah, M. H. (2012): Subaltern urbanization in India, *Economic and Political Weekly*, 47 (30), 52-62
7. Gilbert, A. (1993): Third World cities: The changing national settlement system, *Urban Studies*, 30 (4/5): 721-740
8. Ginsburg, N., Koppel, B. and McGee, T. G. (1991): *The Extended Metropolis: Settlement Transition in Asia*, University of Hawaii Press, Honolulu
9. Graham, S. and Marvin, S. (2001). *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition*, Routledge, London and New York.
10. Jiménez, B and Rose, J. (2009). *Urban Water Security: Managing Risks*. CRC Press, London, Newyork, Leiden, Boca Raton.
11. Kundu, A. (2009): Exclusionary Urbanisation in Asia: A Macro Overview, *Economic and Political Weekly*, 44 (48), 48-58
12. Latham, A., McCormack, D., McNanara, K and McNeill, D.(2009). *Key Concepts in Urban Geography*. Sage, Los Angeles.
13. Macionis, John J. and Vincent N. Parrillo (2017): *Cities and Urban Life*, Pearson, United States.
14. Mathur, K. (2008) *From Government to Governance: A Brief Survey of the Indian Experience*, National Book Trust, India
15. Pacione, M. (2009): *Urban Geography: A Global Perspective*, Routledge, London and New York
16. Pugh, C. (1990): *Housing and Urbanization: A Study of India*, Sage Publication, New Delhi
17. Sivaramakrishnan, K. C. (2015): *Governance of Megacities: Fractured Thinking, Fragmented Setup*, Oxford University Press, New Delhi

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)

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: Approaches, Parameters and Agricultural Systems

- 1.1 Approaches to Agriculture Geography: commodity, systematic, regional and ecological [6]
- 1.2 Determinants of agricultural development: physical, technological, institutional; World agricultural systems. [4]
- 1.3 Role of agro based industries in employment, Agriculture in GDP [4]

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 agriculture [4]
- 2.2 Economic importance of water; Dominance of agricultural water use; Pressures on the supply of water for irrigation; Role of water in agricultural development [4]
- 2.3 Sources of irrigation: Tube well, pumpsets, canals, RLI; Irrigated and unirrigated area; Irrigation efficiency and management [6]
- 2.4 Types of irrigation system in India; Groundwater and surface water use for agriculture; Irrigation Programmes in India
Irrigated farming and Dry farming: Concepts and principles [4]

Unit III: New Dimensions in Agriculture

- 3.1 Mechanization of agriculture: need, scope and progress of mechanization; Use of GM Seeds and its economic and social impact [4]
- 3.2 Diffusion of agricultural innovations: social diffusion and spatial diffusion; agribusiness; contract farming; corporate agriculture [4]
- 3.3 Risk and Uncertainty in Production: input related risk and risk aversion; Adoption of modern technology under production uncertainty [4]
- 3.4 The National Agricultural Policy; Evaluation of the New Agricultural Policy [4]

Unit IV: Contemporary Issues in Indian Agriculture

- 4.1 Agricultural credit; Agricultural Price Policy; Agricultural subsidies [4]
- 4.2 Poverty alleviation strategies; Food aid (OXFAM) and nutrition programmes [4]
- 4.3 Food security and its components; Agricultural Indebtedness; Farmer suicide- critiques of agricultural policies and market pricing [4]
- 4.4 Sustainable development of agriculture; Decline in agricultural sector in India [4]

Suggested Readings: Agricultural Geography

1. Bhalla, G.S. & Alagh, Y.K., *Performance of Indian Agriculture*, Sterling Pub., New Delhi
2. Duckhan, A.N. and Masfield, G.B., *Farming Systems of the World*, London.
3. Griggs, D. *An Introduction to Agricultural Geography*, Routledge, London.
4. Haque, T. *Agrarian Distress in India: Causes & Remedies*, Concept Publishers, New Delhi
5. Husain, Majid. *Agricultural Geography*, New Delhi.
6. John, R, Tarrant. *Agricultural Geography*.
7. Mohammad, A. *Food Production and Food Problem in India*, New Delhi.
8. Mohammad, A. *Environment, Agriculture & Poverty*, Concept Publishers.
9. Mohammad, N. *Perspectives in Agricultural Geography*, New Delhi.
10. Morgan, W.B. and Munton, P.J.C. *Agricultural Geography*, London.
11. Panda, S.C. *Mechanization of Agriculture*, Kalyani Publishers.
12. Shafi, M. *Agricultural Geography of South Asia*, Macmillon, New Delhi.
13. Shafi, M., *Agricultural Geography*, Dorling Kindersley, New Delhi.
14. Singh, J. and Dhillon, S.S. *Agricultural Geography*. Tata McGraw Hill
15. Symons, L. *Agricultural Geography*, London.

Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

Module Name: *Fieldwork Project*

Paper Type: Practical

Paper Code: GEOG 1091

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-environmentrelationship

- 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.)

Pages containing illustrations (sketches, graphs, diagrams, maps, photographs, etc) = 25 (maximum). Documentation and generation of the field report with the following arrangement : preface, introduction, objectives, methodology, data acquisition, data analysis, data display and interpretation, analysis and conclusion, appendix (of data), and bibliography / references. Word Limit = 8000 (maximum) excluding Tables and Appendix (Computer typed, Line Spacing = 1½, Arial / Times New Roman /Calibri10 / 11) Time allotted for Viva Voce / Examinee = 15 minutes (maximum), Marks on Field Performance of individual students (= 15) shall be awarded by the Internal Examiner(s) and on both Presentation (= 15) and Viva Voce (= 20) by the External Examiner(s).

Suggested Readings: *Fieldwork Project*

1. Saha, P.K. and Basu, P. (2009): *Advanced Practical Geography*, Books and Allied (P) Ltd., Kolkata
2. Sarkar, A. (2008): *Practical Geography: A Systematic Approach*, Orient BlackSwan, Kolkata

DEPARTMENT OF GEOGRAPHY
PRESIDENCY UNIVERSITY

Detailed Syllabus for Fourth Semester of the Postgraduate Course in Geography

Module Name: *Dissertation Project*

Paper Type: Dissertation

Paper Code: GEOG 1092

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 shall be awarded by the External Examiner(s) on the Research and Academic Quality of the Report (= 15) followed by the Presentation and Viva Voce (= 35).