

**SYLLABUS
FOR
Ph.D. COURSE WORK
IN
GEOGRAPHY**



DEPARTMENT OF GEOGRAPHY

School of Sciences

NAGALAND UNIVERSITY

LUMAMI

STRUCTURE AND SYLLABUS

Candidates selected for Ph.D. Programme require to undergo one semester course work (6 months duration) covering 3 Papers as follows:-

Sl. No.	Course No.	Title of the Course
	PAPER I (GEOG-501)	Research Methodology (100 marks) : 5 credits, each credit for 20 marks with total of 50 hours.
	PAPER II (GEOG-504)	Optional/Elective Paper (100 marks) : 5 credits each credit for 20 marks with total of 50 hours. : Students can opt any (one) paper from the following:-
1.	GEOG-502 A	Applied Geomorphology
2.	GEOG-502 B	Hydrology and Applied Climatology
3.	GEOG-502 C	Environmental Geography
4.	GEOG-502 D	Population and Development
5.	GEOG-502 E	Advanced Agricultural Geography
6.	GEOG-502 F	Political Geography
7.	GEOG-502 G	Geography of Social Well Being.
8.	GEOG-502 H	Remote Sensing, GIS & GPS Application in Geography
PAPER III (GEOG- 503) ((A)60+(B)20+(C)20= 100 marks)) : 5 credits, each credit for 20 marks with total of 50 hours		
(A)	Review of Literature	
(B)	Report Writing	
(C)	Seminar	

PAPER I

GEOG- 501

RESEARCH METHODOLOGY

Course outline

- Unit- I** Research : meaning- need for scientific research, types of research, approaches to geographical research; traditional and scientific- identification of the problems.
- Unit- II** Logic in research; hypothesis, concepts, facts, principles, laws, theory and their implications in geographic research; research trends in Geography.
- Unit- III** Research design: selection of the topic, statement of the problem, formulation of hypothesis, testing of hypothesis, parametric & non parametric tests: T- test, F- test, χ^2 test & Z- test; literature survey and the role of internet in the preparation of bibliography.
- Unit- IV** Sources of data: data acquisition and analysis; primary and secondary preparation of questionnaire; structuring and transformation of data.
- Unit- V** Thesis writing : organization of the thesis, preliminaries of the text and the reference materials; drafting of the thesis: first, second and final (form and style), writing of abstract; research paper for seminars, conferences and journal publications.

Suggested Readings

1. Anderson, J., Durston, B.H. and Pool, M, (1970) Thesis and Assignment writing, Wiley Eastern Ltd., New Delhi.
2. Cooray, P.G.,(1992) Guide to Scientific and Technical Writing, Hendagala, Srilanka.
3. Davis J.C.(1986) statistics & data Analysis, John Wiley & sons NY Fitz Gerald.
4. Hang, L.L., and Lounsbury, J.F., (1971) Research Methods in Geography Brown company Publishers, Iowa.
5. Kothari, C.R., * (1990) Research Methodology: Methods & Techniques, Vishwaprakasha.
6. Quantitative Techniques in Geography; Hammont and Mecullch.
7. Statistical Methods in Geographical Study; Aslam Mahamed.
8. Quantitative; J.P. Cole and C.A.M. King.

PAPER II

Optional/Elective Paper

GEOG- 502 A

APPLIED GEOMORPHOLOGY

Course Outline

- Unit- I*** Nature and scope of applied geomorphology; development and applied applications of applied geomorphology; watershed as a geomorphoic unit; tools and techniques in applied geomorphology.
- Unit-II*** Indogenetic and exogenetic processes; plate tectonics; weathering; mass movements; geomorphological hazards.
- Unit-III*** Geomorphoic system; environmental geomorphology; applied geomorphology in environmental management.
- Unit-IV*** Remote sensing and GIS applications in geomorphology; applied geomorphology in sustainable development.
- Unit-V*** Applied geomorphology in India; geomorphoic study and geomorphological mapping of some selected sites of Nagaland.

Suggested Readings

1. C.A.M. King; Techniques in Geomorphology. Arnold London.
2. Cook, R.V & Doornkamp, J.C, 1993; Geomorphology in Environmental Management. Clarendon Press, Oxford.
3. Gregory, K.G & Walling, D.E. 1973; Drainage Basin: Form and process. Edward Arnold Ltd. Great Britain.
4. Leopold, L.B, Wolman, G.M, and Miller, J.P 1964: Fluvial processes in Geomorphology S.Chand and Co.Ltd, New Delhi.
5. Walling, G.K. 1980; Drainage Basin and Geomorphological Perspective.
6. Geology of N.E. Region. Miscellaneous Publication, Geological Survey of India.

Course contents

- Unit- I** Meaning and scope of hydrology; hydrological cycle; precipitation, evaporation, evapotranspiration: spatial and temporal variation over India.
- Unit- II** Groundwater: origin, occurrence (aquifers), storage, recharge, discharge and runoff; water balance concept and equation: deficit, surplus and soil storage.
- Unit- III** Watershed management: principles, objectives and techniques; rain harvesting as a strategy of water resource conservation; water pollution; sprinkler irrigation.
- Unit- IV** Meaning and scope of meteorology; climate classification: Thornthwait and Koppen; cloud seeding, acid rain.
- Unit- V** Climate change and its consequences; new trends in applied climatology, application of remote sensing and GIS for water resource management; national water policy in India.

Suggested Readings

1. Bilas, R (1998); Rural Water Resource Utilization and Planning, Concept Publishing Company, New Delhi.
2. Bouwer, H.: BGround Water Hydrology, **McGraw- Hill Book., New York. 1978.**
3. Bruce J.P. & Clerk R.H., Introduction to hydrometeorology pergamon press, Oxford, 1996.
4. Chow, V.T., (ed.): Handbook of Applied Hydrology: A Compendium of Water Resources Technology. McGraw Hill, New York, 1954.
5. Critchfield, H.J. (2003): General Climatology. Prentice- Hall of India, New Delhi.
6. Chorley, R.J. (ed.): **Introduction to Geographical Hydrology**, Methuen, London, 1965.
7. Chorley, R.J. (ed.): **Water, Earth and Man**, Methuen, London.
8. Dakshinamurthy, C. et al., Water Resources of India and their utilization in Agriculture. Indin Agriculture Research Institute, New Delhi, 1973.
9. David Keith todd, Ground Water Hydrology John Willy and sons, New York, 1959.
10. Dhawan, B.D., Indian Water Resource Management for irrigation: Issues critiques reviews Common wealth publishers, New Delhi, 1993.
11. Karanth, K.R.: **Groundwater Assessment: Development and Management**, Tata McGraw Hill, New Delhi, 1987.
12. Matter, J.R., Water Resources. Distribution, Use and Management, John Wiley, Marylane, 1984.
13. Mather J.R.: **Water Resources**, Jophn Wiley & Sons Inc., London, 1984.
14. Murty, J.V.S.: **Watershed Management in India**, Wiley Eastern Ltd., New Delhi, 1995.
15. Narayana, V.V.D. Sastry, G. and, U.S. Patniaik: **Watershed Management**, **ICAR, New Delhi, 1997.**
16. Peter Amithson, Ken Addison et. Al.: **Fundamentals of the Phusical Environment**, Routledge, Taylor and Francis group, London and New York, 2002.
17. Raghunath, H.M.: **Hydrology**, Wiley Eatern Ltd., New Delhi, 1988 (Reprint)
18. Rao, K.L.: **India's Water Wealth**, Orient Longman, New Delhi, 1997.
19. Reddy R.J.: **The Textbook of Hydrology**, Laxmi Publ., New Delhi, 1999.
20. Robert J. Reimond, Watershed ManagementPractice Poliocies and Co- ordination, McGraw- Hill, New Delhi, 1997.
21. Sharma, R.K. and Sharma. T.K.: **Hydrology and Water Resources Engineering**, Dhanpat Rai., New Delhi, 1997.
22. Singh R.A. and Singh S.R.: **Water Management: Principles and practices**. Sara Publ., Varanasi. 1979.
23. Sinha, N.: **Water Resource Management**, Har- Anand Publ., New Delh, 1995.
24. Sokolov, A.A. and Chapman, T.G. (eds.): **Methods for water Balance Computations: An Inernational Guide for Research and Practices**, The UNESCO, Paris, 1974.
25. Thompson, R.D. et. al.: **Processes in Physical Geography**, Longman, London, 1986.
26. Ward, R.C.: **Principles of Hydrology**, McGraw- Hill Publ. Co. Ltd., London, 1967.

GEOG- 502 C ENVIRONMENTAL GEOGRAPHY

Course outline

- Unit- I** Definition, nature and scope of environmental geography; approaches to environmental geography.
- Unit- II** Ecology and its relationship with geography; ecological concepts and principles.
- Unit- III** Biosphere as an ecosystem, ecological balance, biomes and their types.
- Unit- IV** Environmental change in relation to man and his activities; environmental degradation; ecological crisis, global warming and climate change; deforestation, soil erosion; environmental hazards and disaster.
- Unit- V** Environmental consequences of human activities in North Eastern Hills of India with special reference to Nagaland; application of Remote Sensing, GIS and GPS in environmental management.

Suggested Readings

1. Park. C.C., 1980: Ecology and Environmental Management. Butterwoths, London.
2. Paul, R. E. et al. 1977: Ecoscience: Pollution, Resources and Environment. W. H. Freeman, Sanfrancisco.
3. Strahler, A. H. & Stralher, A. N. 1977: Geography and Man's Environment, J. Wiley, N. York.
4. Russwurm, L. H. & Sommerville, E., 1985: Man's Natural Environment. A System's Approach. Duxbury, Massachusetts.
5. C. S. E., 1984: The state of India's Environment- Citizen's Reports. Centre for Science and Environment (CSE), New Delhi.
6. Saxena, H. M., 1999: Environmental Geography. Rawat Publications. Jaipur and N. Delhi.
7. Dassman, R. F., 1976: Environmental Conservation. John Wiley & Sons, New York.
8. Edington J. M. and Edington, M. A., 1977: Ecology and Environmental Planning. Chapman and Hall, London.
9. Harvey, b. and Hallet, J. D., 1977: Environmental and Society: An Introductory Analysis, Macmillan, London.
10. Thomas, W. L. (ed.), 1956: Man's role in changing the Face of the earth. University of Chicago Press, Chicago.
11. Simmons. I. G., 1974: The Ecology of Natural Resources. Edward Arnold, London.
12. Whittaker. R. H., 1975: Communities and Ecosystems, 2nd edn. Collier- Macmillan, London.
13. Singh. L. R. et al. (eds.), 1983: environmental management. Allahabad Geographical Society, Deptt. of Geography. University of Allahabad.
14. Singh, Savindra. 1991: Environmental Geography. Prayak Pystak Bhawan. University Road Allahabad.

GEOG -502 D POPULATION AND DEVELOPMENT

Course Outline

- Unit- I** Population and development; role of population geographer and demographer in understanding development.
- Unit- II** Theories: Ricardo, Malthus, Marx, Neo-Malthusians; demographic transition models.
- Unit- III** Demographic indicators of development and quality of life, migration in development/underdevelopment context, causes and consequences.
- Unit- IV** Concepts and measurements of key demographic variables; vital rates, life table and life expectancy; methods of population projection.
- Unit- V** Consequences of population explosion; geo-environmental impact on population distribution; human resource approach in understanding population as a crucial input in development.

Suggested Readings

1. Ehrlich, P.A.H Ehrlich and J.. Holdren 1977; Eco-science W.H. Freeman, San Fransisco.
2. Meadows, D.L. and D. Meadows 1973; The limits to growth, London.
3. Harvey, D. 1977; Population, Resources and the ideology of science in Respect (ed) Radical geography Methuen, London.
4. Schumacher, E.F. 1973; Small is Beautiful: A study of economic as if people matters, Blond and Bridges, London.
5. Bagchi A.K. 1982; The Political Economy of Underdevelopment, Cambridge, London.
6. Ahmed, A. et al 1990; Mountain Population Pressure, Vikas, New Delhi.
7. Chandana, R.C.; 1986; A Geography of Population, Kalyani publishers, New Delhi.
8. Bhende Asha, A. and Kanitkar, T; 1982; Principles of Population Studies, Himalaya Publishing House, Bombay, 2nd Ed.
9. Premi, M.K. (1991) India's Population, Heading Towards a Billion; D.K. Publishers and Distributors, Delhi.
10. Premi, M.K. et al; 1983: An Introduction to Social Demography, Vikas Publishing House, Pvt. Ltd., New Delhi.
11. Sundaram, K. V. and Nangia, Sudesh; Population Geography, Heritage Publishers, New Delhi.

Course Outline

- Unit- I** Development and approaches in agricultural geography; delimitation of agricultural regionalization; agro-climatic regional planning and agro-climatic regionalization of India.
- Unit- II** Sources and significance of land use and agricultural data, designing of questionnaire from primary data, formulation of hypothesis, models and their significance.
- Unit- III** Globalization of agriculture, international trade and food security in India.
- Unit- IV** Application of Remote Sensing and GIS in agricultural geography; environmental consequences of shifting cultivation in North-East India with a focus on Nagaland.
- Unit- V** Land use system and changes in India with a focus on North-East India.

Suggested Readings

1. Bansil, P.C. Agricultural Statistics in India 2nd edition. New Delhi, Arnold Heinemen.
2. Coppock, J.K. 1968. The Geography of Agriculture, Journal of Agricultural economics, 19.
3. Farmer, BH 1977. Green Revolution? Mac Millan, London.
4. Grigg D.B. 1973. Agricultural Systems of the World, Cambridge University Press, UK.
5. Husain M. 1996. Systematic Agricultural Geography, Rawat Publ. Jaipur.
6. Kostrowicki, J. 1964. Geographical Typology Principles and Methods, Geographica Polimica 2.
7. Reed, L.G. 1968 Agricultural Geography, London.
8. Singh J. et al 1984: Agricultural geography, Tata Mc Graw Hill, New Delhi.
9. Stamp, L.D. 1962. Land of Britain its uses and misuse, London.
10. Symon, L. 1968. Agricultural Geography, London.
11. Tarrant, J.R. 1974: Agricultural Geography, Halstead Press, New York.
12. Whittlesey D 1936: Major Agricultural Regions of the Earth, Annals of Association of American Geographers, 26.
13. Oza, M.P. Bhagia, Nita et al 1999. National Wheat Acreage Estimation for 1995-96 using multivariate IRS-1C WiFS Data, Journal of the Indian Society of Remote Sensing, Vol. 24, No. 4 Dec.
14. Lich, P.A.H. Ehrlich and J.P. Holdren 1977: Eco-Science W.H. Freeman, San Francisco.
15. Meadows, D.L. and D. Meadows 1973: The Limits to grow, London.

GEOG-502 F POLITICAL GEOGRAPHY

Course Outline

- Unit- I** Nature and scope of political geography, and approaches to political geography.
- Unit- II** Historical development; major contributions and concepts: Ratzel, Hartshorne's German geopolitik, Mackinder's global strategy.
- Unit- III** Significance of territory and emerging themes in political geography, boundary and frontier; core and periphery; globalization and conflict management.
- Unit- IV** Political geography of contemporary India; nature of Indian federalism; region and regionalism, boarder issues and problems.
- Unit- V** Geopolitical frame work of Northeast India with special reference to Nagaland.

Suggested Readings

1. Ardrey, Robert 1968; Territorial Imperative, London.
2. Fisher, E.A, Ezast, W.G. and Spate, OHK (eds) 1969; Changing Map of Asia, Revised Edn, Methuen, London.
3. Gopalakrishnan, R. 1995; Insurgent North-East India, Vikas, New Delhi.
4. Gopalakrishnan, R. 1996; Socio-Political framework of the North-East, Vikas, New Delhi.
5. Gopalakrishnan, R. 1996; Geography of India, Jawahar, New Delhi.
6. Gottman J. 1972; Significance of Territory, Charlottesville.
7. Kumar, R. 1996; Regionalism of Politics in India, Mohit, New Delhi.
8. Rao, M.S. 1958; Personality of India, M.S. University. Baroda.
9. Rokkan, S. (ed) 1983; Politics of Territorial Identity, Sage, London.
10. Rosemary, IIT. Terror, Force and States; A apth from Modernity, Edward Elgar, UK.
11. Verma, R.K. 1994; Regionalism and sub-regionalism in State Politics, Deep and Deep, New Delhi.
12. R.D. Dikshit; Perspective in Political Geography, Concept.
13. Jean Cottman – Core and Periphery; Sage Publications, California.
14. Peter J. Taylor & flint, 2000; 'Political geography; World economy, nation- state and locality' Pearson Education, N. Delhi.
15. Michael Pacione, 2001; 'Progress in Political Geography' Groom Helm, London.
16. Martin Ira Glassner & Harm J. De Blij, 1980; ' Systematic Political Geography' John Wileys & Sons, N. York.
17. Paul Brass, A. 1991; 'Ethnicity and nationalism; Theory and comparison Sage Publicatios, N. Delhi.
18. Mac Kenzie, A, 1989; 'The North East Frontier of India' Mittal Publicatios N. Delhi.
19. Pakem, B. 1990; 'Nationality, Ethnicity & Cultural Identity in NEI' Omsons Publications, N.Delhi.
20. Bhugan, B.C.. 1992; 'Political Development of NEI' Part I & II, Omsons Publications N. Delhi.
21. Immanuel Wallerstien, 1991; 'Geopolitics and Geo cultural Essay on the Changing World System' Cambridge Univ. Press, N.York.

Course Outline

- Unit- I** Social geography, and defining of social well being; territorial social indicators; socio geographic problems; social movements and social justice.
- Unit- II** Literacy/health and social well being; regional disparity in literacy and education in India; social disparity in educational attainment in the case of gender, ethnic and caste groups.
- Unit- III** Problems of educability among tribal and caste- based societies in India.
- Unit- IV** Regional disparity in healthcare facilities in India; regional patterns in the prevalence of communicable diseases in India.
- Unit- V** Social geography of Nagaland.

Suggested Readings

1. Ahmad, A. 1982; Education of the Scheduled Tribes, Some Aspects of Inequality (Mimeo).
2. Ahmad, A. 1993; Social structure and regional development, Rawat, Pub. Jaipur.
3. Akhtar, R and Larmth ATA 1977; Resurgence of malaria in India, Geo Journal Vol. I pp 69-70.
4. Akhtar, R. 1983; Spatial Distribution and Growth of Health Facilities in Rajasthan, Geographical Review of India, Culcutta, Vol 40 No. 3.
5. Akhtar, R. et al 1936; Geographical aspects of health and diseases in India, Concept, New Delhi.
6. Akhtar, R. 1991; Environmental and Health Themes in Medical Geography, Asish, New Delhi.
7. Desai, A.R. 1969; Rural sociology in India, Popular, Bombay.
8. Goody, Jack 1975; Literacy in Traditional Societies, Cambridge University Press, Cambridge.
9. Sopher, D.E; Sex disparity in Indian Literacy in DE Sopher (ed) An Exploration of India, Cornell Univ. New Delhi.
10. System, Almond (1996) "Determinants of Literacy in Meghalaya, NEHU, Shillong, (Unpublished M.Phil Dissertation).
11. Smith, D.M.1973; Geography of Social Well Being in the United States, Mc. Graw Hill, New York.
12. Smith, D.M.1975; Patterns in Human Geography, David and Charles, Newton Abbot, Penguin, Harmondsworth.
13. Smith, D.M.1977; Human Geography a welfare approach, Arnold London.
14. Smith, D.M.1979; Where the grass is greener, Penguin, New York.
15. Lanusosang T.; Social Geography of Nagaland, Kohima.

GEOG- 502 H REMOTE SENSING, GIS & GPS APPLICATIONS IN GEOGRAPHY

Course Outline

- Unit- I** Historical development of Remote Sensing, GIS & GPS; concepts and basics of RS, GIS & GPS as a Geo-spatial Information Technology (GIT); relevance in Geography.
- Unit- II** Fundamentals of photogrammetry; Air Photo interpretation; the Electromagnetic Radiation; energy interactions with the atmosphere and earth surface features; remote sensing satellite, platforms and sensors.
- Unit- III** Satellite imageries; image processing; techniques of visual interpretation; digital processing; image enhancement and classification.
- Unit- IV** Geography as a geo-spatial science; computer environment for GIS, elements of geo-spatial data; raster and vector data structure, data capture- storage and analysis; database management systems.
- Unit- V** GIS technology; coordinate system; basic principles of computer assisted cartography for GIS; Remote Sensing data as a data source for GIS and integration of GIS in spatial planning; application of Remote Sensing, GIS and GPS technologies in sustainable development.

Suggested Readings

1. Barrett, E.C. & Curtis, L. F.; 1992; Fundamentals of Remote Sensing and Air Photo Interpretation, Mc Millan, New York.
2. Campbell, J.; 1989; Introduction to Remote Sensing. Guilford, New York.
3. Curran, Paul, J. 1985; Principles of Remote Sensing, Longman, London.
4. Hord, R.M.; 1989; Digital Image Processing of Remotely Sensed Data, Academic, New York.
5. Luder, D.; 1959; Aerial Photography interpretation; Principles and Applications, Mc Graw Hill, New York.
6. Rao, D.P., 1989; Remote Sensing for Earth Resources, Association of Exploration Geophysicist, Hyderabad.
7. Aronoff, S.; 1986; Geographic Information Systems : A Management Perspective, DDL Pub. Ottawa.
8. Burrough, P.A.; 1986; Principles of Geographic Information system for Land Resources Assessment, oxford University Press, Oxford.
9. Maquire, D.J., Goodchild, M.F. and Rhind, D.W., 1991; Geographical Information Systems: Principles and Applications. Taylor & Francis, Wast.
10. Mark, S. Monmonier; 1982; Computer Assisted Cartography. Prentice Hall, Englewood Cliff, New Jersey.
11. Raju, P.L.N. et al, 2000; Geographical Information Science, Reference material, Vol. I, Geo Informatics Division; Indian Institute of Remote Sensing, Dehradun.
12. Peuquet, D.J. and Marble, 1990; Introductory readings in Geographic Information Systems, Taylor & Francis, Washington.
13. Star J and Estes, 1994; Geographic Information Systems: An Introduction, Prentice Hall, Englewood Cliff, New Jersey.
14. Aggarwal, N.K 2006; Essentials of GPS (2nd ed.) Geodesy 7 GPS, Hyderabad.
15. Nag P; Thematic Cartography and Remote Sensing. Concept, New Delhi.
16. Barrett, E.C. & Curtis, L.F., 1976; Introduction to Environmental Remote Sensing, Chaoman Hall, London.
17. Smith, H.T.U., 1943; Aerial Photographs and their application. Appleton Century Crafts, New York.