w.e.f. 2021-22

Examination Scheme & Syllabus for Pre-Ph.D. Course Work (Geography)

Summary of the Examination Scheme

Name of the Programme	:	Pre-Ph.D. Course Work in Geography
Duration	:	6 Months (One Semester)
Minimum Attendance Required	:	75% in individual course
Total Credits	:	12 (Twelve)
Total Marks	:	300 (Three Hundred)
Minimum Passing Marks (Aggregate)	:	55%

Assessment/Evaluation of Theory Examination:

Internal Assessment/Evaluation:

Minor Test Marks	Attendance Marks	Assignment/Quizzes Marks	Total Marks
10 (Ten)	05 (Five)	05 (Five)	20 (Twenty)

Duration of Examination:

Minor Test	Major Test
1.5 hour	3 hours

To qualify the course, a student is required to score a minimum of 55% marks in aggregated including the internal evaluation/assessment and Major Test (End Semester Examination). For details, please see the Ph.D. Ordinance of the esteemed University which is available on the university website.

Detailed Examination Scheme: Pre-Ph.D. Course Work (Geography):

Course/ Paper Code	Name of the Course/Paper	Type of Course/ Paper	Credits	Contact Hours per Week	Examination Scheme		Total Marks
					Final Semester Examination Marks	Internal Assessment Marks	
21-GEOPH-101	Research Designs & Methods	C.C.	4	4	80	20	100
21-GEOPH-102	Quantitative Techniques & Spatial Analysis	C.C.	4	4	80	20	100
21-GEOPH-103	Advance Research Methods & Techniques: Physical Geography	O.C.	4	4	80	20	100
21-GEOPH-104	Advance Research Methods & Techniques: Population Geography						
21-GEOPH-105	Advance Research Methods & Techniques: Urban Geography						
Total			**12**	**12**	**240**	**60**	**300**

C.C. = Compulsory Course, O.C. = Optional Course/Paper.

Each candidate has to study three papers: 21-GEOPH-101 and 21-GEOPH-102 are Compulsory papers/courses.
One paper (optional) is to be chosen from 21-GEOPH-103, 21-GEOPH-104 & 21-GEOPH-105.

The choice of specialisation/optional paper shall be based on the research interest of the student. A student who is willing to carry out his/her research in Physical Geography shall choose 21-GEOPH-103 course/paper, a student who is willing to carry out his/her research in Demography & Population Geography shall choose 21-GEOPH-104 course/paper and a student who is willing to carry out his/her research in Regional Development & Urban Geography shall choose 21-GEOPH-105 course/paper. The specialisation paper shall be selected on the basis of the research interest of the student with due consultation with the faculty members and H.o.D/Chairperson of the Department.

Syllabus of Pre-Ph.D. Course Work (Geography) w.e.f. 2021-22

21-GEOPH-101

Research Designs & Methods

Maximum Marks-100
Theory Examination-80
Internal Assessment-20
Max. Time- 3 Hours

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Objective: This course aims to develop the basic understanding of students about the conceptual framework about Research Designs & Methods in the Geography. The basic objective of this paper is to familiarize the students with the concept of research, formulation of research problem, various components of research, citation & index database and publication & research ethics.

Learning Outcomes: This course will develop scientific aptitude and conceptual understanding of research design and methods. The students will learn about the basic of research, identification of research problems, formulation of research designs, various components of research, various research databases and ethics in research.

Unit I

Observations, Conceptualization, Hypotheses, Models, Laws and Theories, Paradigms in Geographic Research, Types of Research: Descriptive vs. Analytical; Applied vs. Fundamental; Quantitative vs. Qualitative and Conceptual vs. Empirical. Identification of Research Problems and Objectives of Research, Research Design and Methods in Geography, Research Proposal and Important Features of Good Research Design.

Unit II

Literature Review: Objectives and Importance, Sources and Types of Geographical Literature, Procedure of Critical Literature Review and Ideal Literature Review, Identifying Research Gaps from Literature Review, Citation and Acknowledgement; Citation Database: Web of Science, SCOPUS, Softwares (Mendeley etc.); Indexing Database, Research Metrics, Impact Factor, Citation Report, Metric, h-index, g-index etc.

Unit III

Sources of Data Collection in Geography: Primary and Secondary; Methods of Data Collection: Observation, Field Survey (Physical & Socio-economic), Schedule, Interview; Sampling Techniques, Technographic Data & Segmentation, Spatial and Non-Spatial Data, Application of Raster and Vector Data in the Analysis of Geographical Phenomena, Methods and Techniques of Spatial Data Analysis, Participatory GIS, Procedure, Methods and Techniques for Environmental and Social Impact Assessment

Unit IV

Research Ethics, Plagiarism, Copyrights, Intellectual Property Rights, Scientific Misconduct: Falsification, Fabrication & Plagiarism (FFP); Publication Ethics & its Importance, Best Practices, Standard Guidelines, COPE, WAMC etc., Violation of Publication Ethics, Research Paper, Thesis & Report Writing: Structure & its Components, Conflicts of Interest, Plagiarism Software (Turnitin etc.)

Suggested Readings/References:

1. Bolton, T. and Newbury, P. A (1968). Geography Through Fieldwork. Blandford Press, London.
2. Bryman, A. (2016). Social Research Methods. Oxford University Press.
3. Black, J. and Champion, D. J. (1976). Methods and Issues in Social Research. New York: John Wiley and Sons.
4. Carlos, C.M. (2000). Intellectual property rights, the WTO and developing countries: the TRIPS agreement and policy options. Zed Books, New York.
5. Coley, S.M. and Scheinberg, C. A. (1990). Proposal Writing, Sage Publications.
6. Day, R.A., 1992.How to Write and Publish a Scientific Paper, Cambridge University Press.
7. Fink, A. (2009). Conducting Research Literature Reviews: From the Internet to Paper. Sage Publications.
8. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K. (2002). An introduction to Research Methodology, RBSA Publishers.
9. Goode, W. J. and Hatt, P.K. (1982). Methods in Social Research. McGraw-Hill, New York.
10. Kothari, C.R. (1990). Research Methodology: Methods and Techniques. New Age International.
11. Johnston, R. J. (1991). A Question of Place: Exploring the Practices of Human Geography. Blackwell.
12. Keith, H. (2002). Researching Human Geography. Oxford University Press.
13. Leedy, P. D. and Ormrod, J. E. (2004). Practical Research: Planning and Design, Prentice Hall.

14. Limb, Mclanie (2001). Qualitative Methodologies for Geographers. Issue and Debates. Arnold, London.
15. Mishra, H. N., and Singh, V. P. (ed.) (1998). Research Methodology: Social, Spatial and Policy Dimensions. Jaipur: Rawat Publisher.
16. Prasad, H. (1992). Research Methods and Techniques in Geography. Jaipur: Rawat Publication.
17. Sinha, S. C. and Dhiman, A. K. (2002). Research Methodology, Ess Ess Publications.
18. Stoddard, Robert H. (1982). Field Techniques and Research Methods in Geography. Kendall/Hunt Pub. Dubuque.
19. Trochim, W.M.K. (2005). Research Methods: the concise knowledge base, Atomic Dog Publishing.
20. Wadehra, B. L. (2000). Law relating to patents, trademarks, copyright designs and geographical indications. Universal Law Publishing.

Syllabus of Pre-Ph.D. Course Work (Geography) w.e.f. 2021-22

21-GEOPH-102

Quantitative Techniques & Spatial Analysis

Maximum Marks-100
Theory Examination-80
Internal Assessment-20
Max. Time- 3 Hours

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Objective: This course involves the study of statistical approaches to the analysis of spatial information and processes. The emphasis shall be given to Quantitative research techniques i.e. descriptive, inferential, bi-variate and multi-variate analyses and spatial analysis.

Learning Outcomes: This course will develop skills of articulation and critical analysis of research material, selection of suitable research methods & statistical techniques for research. This course will also develop understanding about various techniques of geospatial analysis.

Unit I

Theory of Distribution, Inferential Statistics: Sampling, Significance, Application and its Measures, Variability and its Measure; Inequality: Significance, Uses and Measures: Lorenz Curve, Gini's Coefficient, Theil Index etc., Locational Analysis: Location Quotient, Nearest Neighbour Analysis, Measures of Centrality, Connectivity & Shape.

Unit II

Bi-Variate Analysis: Significance and Techniques, Correlation: Karl Pearsons Product Moment Correlation, Spearman's Rank Correlation (rho), Correlation Coefficient, Parametric Test: T-test; Z-test, Non-parametric Tests: Chi-square, Kolmogorov Smirnov, Binomial, Mann-whitney etc., Test of Significance and Hypothesis Testing, Application of R, SPSS & Excel in Statistical Analysis.

Unit III

Causal Relationship and Estimation: Simple Linear Regression and Residuals; Logistic Regression, Multi-variate Analysis: Partial and Multiple Correlation, Multiple and Step-wise Regression, Techniques for Normalisation of Scale, Composite Index: Principle Component Analysis, Factor Analysis, Cluster Analysis, Discriminant Analysis etc.,

Unit IV

Computer Aided Cartography, Applications of Remote Sensing & GIS, Geostatistical Data: Random Fields, Variograms, Covariances, Stationarity, Non-stationarity, Kriging, Simulations. Spatial Analysis: Mathematical Operations, Distance Operation, Interpolation Methods (Thiessen Polygons, Density Estimation, Inverse Distance Weighted), Topology & Network Analysis, Neighbourhood Analysis, Spatial Auto Correlation & Spatial Clustering, Spatio-temporal Analysis & Modeling etc.

Suggested Readings/References:

1. Aslam, M. (1993). Statistical Methods in Geographical Studies. New Delhi: Rajesh Publications.
2. Arora, P. N. & Arora, S. (1945). Foundation Course in Statistics. New Delhi: S. Chand and Company Ltd.
3. Hoshmand, A. R. (1998). Statistical Methods for Environmental and Agricultural Sciences. New York: CRC Press.
4. Fotheringham, A. S., Brunsdon, C., and Charlton, M. (2000). Quantitative Geography: Perspective on Spatial Data Analysis. Sage Publishers.
5. Scott, E. R. (1993). Maximum Likelihood Estimation: Logic and Practice. Newbury Park: Sage.
6. Fox, J. (2007). Applied Regression, Generalized Linear Models, and Related Methods. (2nd Edition). Thousand Oaks, CA: Sage.
7. Gregory, S. (1963). Statistical Methods and the Geographer. Longman.
8. Hammond, R. and McCullagh, P. (1974). Quantitative Techniques in Geography. Oxford: Clarendon Press.
9. Haring, L. (1975). Scientific Geographic Research. U.S.A: W. C. Brow Company.
10. Levin, J. and Fox, J. A. (2006). Elementary Statistics in Social Research (10th edition). New Delhi: Peason Education.
11. Lillesand and Kiefer. (1994). Remote Sensing and Image Interpretation. New York: John Wiley and sons Inc.
12. R. J. Johnston (1989). Multivariate Statistical Analysis in Geography. Longman Scientific and Technical, John Wiley & Sons.
13. Rogerson, P. A. (2010). Statistical Methods for Geography (A Student's Guide). New Delhi: Sage Publication.
14. Paul, S. K. (1998). Statistics for Geoscientists: Techniques and Applications. New Delhi: Concept Publishing Company.
15. Scott, L. J. (1997). Regression Models for Categorical and Limited Dependent Variables. Newbury Park: Sage.
16. Waller L.A. and Gotway C.A. (2004) Applied Spatial Statistics for Public Health Data, John Wiley & Sons.

Syllabus of Pre-Ph.D. Course Work (Geography) w.e.f. 2021-22

21-GEOPH-103

Advance Research Methods & Techniques: Physical Geography

Maximum Marks-100
Theory Examination-80
Internal Assessment-20
Max. Time- 3 Hours

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Objective: The basic aim of this course is to provide an overview to students about various research methods & techniques used in the physical geography. The emphasis shall be given on developing comprehensive understanding about various geomorphological techniques, geophysical, chemical and spatial analysis. This course shall provide the detailed understanding about various field techniques commonly used in fluvial & glacial geomorphology and geomorphological mapping. Along with, this course will also provide a brief overview about various Modern-dating techniques.

Learning Outcomes: This course shall develop the scientific & comprehensive understanding of students about various field data collection techniques, geophysical, chemical & elemental analysis; methods of geomorphological mapping and landform analysis, field techniques of fluvial and glacial geomorphology along with numerous dating methods.

Unit I

Designing and Planning for Field Based Research, Pre-field Mapping, Logistical Preparation, Types and Techniques of Field Data Collection and their Verification. Analysis of Earth Material: Particle Size Analysis, Mineralogical & Chemical Analysis, Analysing Form & Structure of Sediments from various Environ; Rock Analysis: Thin Section, Scanning Electron Microscope (SEM), Environmental Scanning Electron Microscope (ESEM) etc.

Unit II

Topographic & Spatial Analysis: Methods of Direct Acquisition of Elevation data (GPS, DGPS, LiDAR, LASER Scanning, Bathymetric Method), Digital Elevation Model (DEM), Geospatial Analysis of Terrain, Hill Slope Analysis, Landform Recognition and Geomorphological Mapping.

Unit III

Techniques in Fluvial Geomorphology: Morphometric Analysis, Cross Section, Plan Geometry, Sampling Techniques of River Bed Material; River Velocity and Flow Properties, Stream Gauging & Discharge Estimation; Suspended Sediment Load: Sampling & Analysis.

Techniques in Glaciology & Glacial Geomorphology: Mapping of Glacial Dynamics with Remotely Sensed Data; Sampling Techniques & Analysis: Glacial Ice and Melt Water; Methods & Techniques of Glacier Mass Balance; Geo-physical Survey of Glacial Ice: Ground Penetration Radar (GPR), Total Station (TS); Tracer Investigation of Glacial Ice.

Unit IV

Environmental Reconstruction Techniques: Coring Method, Diatoms, Pollen, Isotope Analysis, Core Scanning; Chronological Techniques: Absolute & Relative Dating Methods, Dating Techniques: Dendrochronology, Lichenometry, Luminescence, Surface Exposure Dating (10Be & 26 Al), U-Series and Palaeo-magnetism, Tephrochronology etc.

Suggested Readings/References:

1. Allison, R. J. (ed.) (2002). Applied Geomorphology: Theory and Practice. Chichester UK: John Wiley.
2. Benn, D. I. and Evans, D. J. A. (1998). Glaciers and Glaciation. London: Arnold.
3. Bloom, A. L. (1998). Geomorphology. (3rd Edition). New Delhi: Prentice Hall of India.
4. Brian M. (1982). Principles of Geochemistry. J. Wiley & Sons.
5. Charlton, R. (2007). Fundamentals of fluvial geomorphology. Routledge, New York.
6. Dackombe, R. V. and Gardiner V. (1983). Geomorphological Field Manual. London: George Allen and Urwin.
7. Ehlers E.G. (1987). Optical Mineralogy: Theory and Techniques, Blackwell Scientific Publications, New York, John Wiley & Sons.
8. Faure, G. (1986). Principles of Isotope Geology. John Wiley.
9. Ghosh, R. K. (1999). Practical Hydrology. Mohanpur, Nadia, West Bengal: Bidhan Chandra Krishi Viswavidyalaya.
10. Goudie, A. (ed.). (1981). Geomorphological Techniques. London: George Allen and Urwin.
11. Gregory, K. J. and Walling, D. E. (1973). Drainage Basin form and Process: A Geomorphological Approach. London: Edward Arnold.
12. Hubbord, B. and Glasser, N. (2005). Field Techniques in Glaciology & Glacial Geomorphology. London: John Wiley & Sons.
13. Julien, P. Y. (2002). River mechanics. Cambridge University Press.

14. Kale, V. S. and Gupta, A. (2001). Introduction to Geomorphology. Calcutta: Orient Longman.
15. King, C. A. M. (1967). Techniques in Geomorphology. London: Edward Arnold.
16. Klein, C, Hurlbut, C.S., and Dana, J.D. (1998). Manual of Mineralogy (after James D. Dana), 21st Edition, John Wiley & Sons Inc.
17. Lowe, J. J and Walker, M. J. C. (1984). Reconstructing Quaternary Environments. New York: John Wiley and Sons.
18. Mutreja, K. N. (1990). Applied Hydrology. New Delhi: Tata MC-Graw Hill Publishing Company.
19. Mackenzie, W.S. & Adams (1994). A.E. Color Atlas of Rock and Minerals in Thin Section, John Wiley & Sons
20. Robin G. (1988). Chemical Fundamentals of Geology. Chapman and Hall.
21. Sparks, B. W. (1986). Geomorphology. London: Longmans.
22. Thornbury, W. D. (2005). Principles of Geomorphology. (Rev. Ed.). New York: John Wiley.
23. Valley, J., W., and Cole, D., (2001) (Ed.). Stable Isotope Geochemistry, Volume 43, Reviews in Mineralogy and Geochemistry, Mineralogical Society of America and The Geochemical Society.
24. Wooldridge, S. W. and Morgan, R. S. (1959). The Physical Basis of Geography: An Out Line of Geomorphology. London: Longman.
25. World Meteorological Organization. (1966). Climatic Change. Technical Note No.79. Geneva: World Meteorological Organization.

Syllabus of Pre-Ph.D. Course Work (Geography) w.e.f. 2021-22

21-GEOPH-104

Advance Research Methods & Techniques: Population Geography

Maximum Marks-100
Theory Examination-80
Internal Assessment-20
Max. Time- 3 Hours

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Objective: It is an applied course of methods in population geography which is aimed at providing knowledge about the data sources, methods and techniques to study different aspects of population geography. It aims to inculcate basic research skill about the applications of various tools to study research problems related to various dimensions of population geography.

Learning Outcomes: This course shall sharpen the understanding of students about applications of different methods and techniques to study research problems related to population geography. It will also provide student with basic knowledge of various data sources, sampling techniques, statistical analysis, various methods and indices which can be used in demographic analysis.

Unit I

Population Geography: Nature & Scope, Social Group, Racial Group, Family Marriage Kinship, Religion, Social Structures & Social Institutions in India and their Relationship with Population Geography, Spatial & Temporal Changes in Size & Distribution of Population, Social Changes & Transformation in India.

Unit II

Source of Population Data: Population Census, Historical Background, Coverage, Features, Uses, Limitations; Vital Statistics: Historical Background, Civil Registration System (CRS), Sample Registration System (SRS), Coverage, Feature, Uses & Limitations; Population Surveys: Meaning, Uses & Limitation, Major Surveys: National Sample Survey (NSS), World Fertility Survey (WFS), Demographic Health Survey (DHS), Reproductive & Child Health Survey (RCHS), National Family Health Survey (NFHS), Comprehensive Nutrition Survey etc.

Data Appraisal, Sources of Error in Population Data & Correction, Methods, Techniques and their Limitations; Sampling: Concept, Sample Unit, Frameworks, Design, Techniques, Sample Size

Determination, Standard Errors, Non-sampling Errors, Type of Sampling: Simple, Random, Stratified, Clustering, Purposive, Multistage etc.

Unit III

Techniques to Measure Rate of Population growth (Arithmetic , Geometric, Exponential, Decadal), Net Reproduction Rate; Population Projection (Linear, Exponential, Polynomial, geompertz & Logistic Growth curve for Population Projection); Techniques to Measure Population Concentration, Density, Distribution, Distribution – dissimilarity Index; Age & Sex Pyramid, Sex Ratio, Child Sex Ratio, Dependency Ratio (Child, Old & Total); Migration: Trend, pattern and measures of migration, Ravenstein, Lee, Todaro, Stouffer, Zenlinsky, Cumulative Causation Theory etc.

Unit IV

Techniques and Methods to Measure Fertility, Crude Birth Rate (CBR), General Fertility Rate (GFR), Age Specific Fertility Rate (ASFR), Age Specific Marital Fertility Rate (ASMFR), Total Marital Fertility Rate (TMFR), Total Fertility Rate (TFR), Gross Reproduction Rate (GPR), Net Production Rate (NPR), Replacement Level Fertility; Methods of Standardization of Birth Rate; Indirect Method of Estimation of Fertility (Coale-Trussell Model, Reverse Survival Techniques, Role Technique, PIF Ratio); Techniques & Methods to Measure Mortality (CDR, ASDR, IMR, MMR, Under-five Mortality Rate, Neonatal Mortality Rate), Mosley & Chen's Framework for Child Survival; Indirect Methods of Estimation of Infant & Child Mortality Rates; Concept of Development and its Measure (HDI, PGLI, SDI, GDI, MDG, SDG etc.), Gender Disparity: Causes and Indices for Measurement.

Suggested Readings/References:

1. Abler, R, Adams, J and Gould P., (1971). Spatial Organization: The Geographer's view of the World, Prentice Hall, New Jersey.
2. Asha A. Bhende and Tara Kanitkar, (2003). Principles of Population Studies, Sixteenth Revised Edition, Himalaya Publishing House, Mumbai.
3. Bennett, Nail. G., and Shiro Horiuchi (1984). Mortality estimation from registered deaths in less developed countries, Demography, 21(2):217-233.
4. Berer, M., (2000). Making Abortions Safe: A Matter of Good Public Health Policy and Practice, Bulletin, WHO, Vol. 78(5), pp. 590-592. 2.
5. Bhende, A., (1996). Principles of Population Studies (Seventh Edition), Himalaya Publishing House, Bombay.
6. Blalock, Hubert M. (1960). Social Statistics, McGraw-Hill Book Company, New York.
7. Bogue, D., (1969): Principles of Demography, John Wiley and Sons, New York.

8. Bongaarts, J and Potter, R (1983). Fertility, Biology and Behavior: An Analysis of the Proximate Determinants. Academic Press, New York.
9. Bradford, M.G. and Kent, W.A. (1984). Human Geography: Theories and their Applications, Oxford.
10. Cassen, Robert and Bates, Lisa M. (1994). Population Policy: A New Consensus. Washington, D.C.: Overseas Development Council.
11. Chandna, R. C. (1998). A Geography of Population: Concepts, Determinants and Patterns. New Delhi: Kalyani Publishers.
12. Chorley, R. J. and Hagget, P. (1970). Socio Economic Models in Geography. London: Methuen.
13. Clarke, G.M. and Cooke, D.,(1994). A Basic Course in Statistics, Arnold, London.
14. Clout, H. D. (1972). Rural Geography: An Introductory Survey. New York: Pergmon.
15. Coale, A.J., (1981). Robust estimation of Fertility by the Use of Model Stable Population", Asian and Pacific Census Forum, Vol.8 No.2. East-West Centre, Honolulu, Hawaii.
16. Coale, Ansley J. and Paul, Demney (1983). Regional Model Life Tables and Stable Populations, Academic Press, New York.
17. Cohen, Robin, (1996). Theories of Migration, The International Library of Studies on Migration, Edward Elgar, Cheltenham.
18. Cromley, Ellen K. and McLafferty, Sara L., (2002). GIS and public health. Guilford Press, New York.
19. David G. Mandelbaum, (1974). Human Fertility in India: Social Components and Policy Perspectives, University of California Press, Berkeley.
20. Dillon, W.R. and Goldstein, M. (1984). Multivariate Analysis, John Willey and Sons, New York.
21. Dixon, W.J and Massey, F.J. (1983). Introduction to Statistical Analysis, 4th ed., New York, MC Graw Hill, 380-381, 534.
22. Ebdon, E. (1978). Statistics in Geography, Basil Blackwel, Oxford.
23. Gibbs, J. P. (1966). Research Methods. New York: Von Nostrand company, Inc.
24. Goliber, T.J., (1997). Population and Reproductive Health, Population Bulletin Vol. 52(4), Washington, DC: Population Reference Bureau.
25. Goode W J and Hatt P K. (1952). Methods in Social Resasrch. McGraw Hills, New York.
26. Goon, A.M., Gupta, M.K. and Dasgupta, B. (1985). Fundamentals of Statistics Vol. I , The World Press Private Ltd. Calcutta.
27. Government of India (1997) Reproductive & Child Health Program: Schemes for Implementation, Ministry of Health and Family Welfare, New Delhi.
28. Government of India, (2000) National Population Policy, Department of Health and Family Welfare, Ministry of Health and Family Welfare, Govt. of India, New Delhi.
29. Government of India (2002). National Health Policy, Ministry of Health and Family Welfare, New Delhi.

30. Graeme Hutcheson and Nick Sofroniou, (1999). The Multivariate for Social Scientist, SAGE Publications.
31. Grover, N. (1954). Rural Settlement: A Cultural Geographical Analysis. New Delhi: Inter India Publication.
32. Hagget, P. (1971). Locational Analysis in Human Geography. New York: Martin's Press.
33. Hess, B.B. and M.M. Ferree. (1987). Analyzing Gender: A Handbook of Social Science Research. Sage Publication, London.
34. Hinde, Andrew (1998). Demographic Methods. London: Arnold.
35. Jacob S. Siegel and David a. Swanson (2004). The Methods and Materials of Demography, Second Edition, Chapters 1, 2, 3, 7, 9,10, Elsevier Science, USA.
36. Johnson, J. (Eds.). (1974). Suburban Growth. London: John Wiley and Sons.
37. Kish, Leslie, (1995). Survey Sampling, John Wiley and Sons, Inc. New York.
38. Kitchen, R. and Tae, N. J. (2000). Conducting Research into Human Geography: Theory, Methodology and Prctice. London: Prentice Hall.
39. Laboritz, S. and Hagedorn, R. (1971). Introduction to Social Research. USA: McGraw Hills.
40. Lohr L. Sharaon., (1999). Sampling: Design and Analysis, Duxbury Press, London.
41. Mahajan, N. (2014). Population Geography. Delhi: R.K. Publishers.
42. Mandal, R. B. (1979). Introduction to Rural Settlements. New Delhi: Concept.
43. Mandelbaum, D.G., Society in India-Continuity and Change(vol.1) and Change and Continuity, (Vol. 2). University of California Press, London, (1970).
44. Mishra, B.D. (1981). An Introduction to the Study of Population, New Delhi: South Asian Publishers Pvt. Ltd.
45. Mukherji, P.N., (1999). Methodologies in Social Science, Sage Publications, New Delhi.
46. Newell, Colin (1988). Methods and Models in Demography. London: Frances Pinter.
47. Norman R. Kurtz (1999). Statistical Analysis for the Social Sciences, Allyn and Bacon.
48. Palmore, James A. and Gardner, Robert W. (1983). Measuring Mortality, Fertility and Natural Increase: a Self-Teaching Guide to Elementary Measures. Honolulu: East-West Population Institute, East-West Center.
49. Pathak, K.B. and F.Ram, (1998). Techniques of Demographic Analysis, Mumbai: Himalaya Publishing House, Chapter 4, Pp.108-153.
50. Petrov, V. (1985). India: Spotlight of Population. Moscow: Progress Publishers.
51. Pollard, A.H., Yusuf, Farhat and Pollard, G.N. (1990). Demographic Techniques (third edition), Sydney: Pergamon Press.
52. Preston, S. H., Patrick Heuveline and Michel Guillot (2001). Demography: Measuring and Modeling Population Process, Blackwell Publishers, Oxford, UK.
53. Pugh, Thomas F. and Brian MacMohan (1970). Epidemiology: Principles and Methods, Little Brown Publishers, Boston (Chapters 1 through 5).
54. Qazi, S. A. (2010). Population Geography. APH publishers.

55. Ram, F. and K.B. Pathak (1998). Techniques of Demographic Analysis, 2nd Ed, Himalaya Publishing house, Bombay (Chapters 2 & 3).
56. Registrar General, India (1997). Civil Registration System in India, Office of the Registrar General, India, New Delhi.
57. Richard, Peet., (1998). Modern Geographic Thought, Blackwall Publishers.
58. Rowland, Donald T. (2006). Demographic Methods and Concepts. New York: Oxford University Press.
59. Saxena, H. M. (2005). Transport Geography. Delhi: Rawat Publication.
60. Siegel, Jacob S., and David A. Swanson (eds.), (2004). The Methods and Materials of Demography (Second edition). San Diego: Elsevier Academic Press.
61. Singh R. L. and Singh, K. N. (1975). Reading in Rural Settlement Geography, NGSI, Research publication no. 14, National Geographical Society of India, Varanshi.
62. Singh R. L. and Singh, R. P. B. (1980). Rural Habitat Transformation in World Frontiers, 24 IGC publication, Tokyo.
63. Snijders, Tom A.B. and Bosker, Roel J., (1999). Multilevel analysis: An introduction to basic and advanced multilevel modeling. Sage Publications.
64. Srinivas M.N. (1966). Social Change in Modern India, University of California Press, Berkeley.
65. United Nations, (1973). The Determinants and Consequences of Population Trends, Vol. I, Population Studies, No. 50, Chapter VII, New York.
66. United Nations, (1973). Determinants and Consequences of Population Trends, Vol. 1, pages 96-104, UN, New York.
67. United Nations, (1998). Handbook on Civil Registration and Vital Statistics Systems, Management, Operation and Maintenance, New York.
68. United Nation (2001). Population, Gender and Development: A Concise Report. UN, Economic and Social Affairs (Dept. of), New York
69. Weeks, John R. (2005). Population: An Investigation to concepts and Issues. 9th Edition, Wadsworth Publishing Co. CA.
70. World Bank. (1991). Gender and Poverty in India. World Bank, Washington.

Syllabus of Pre-Ph.D. Course Work (Geography) w.e.f. 2021-22

21-GEOPH-105

Advance Research Methods & Techniques: Urban Geography

Maximum Marks-100
Theory Examination-80
Internal Assessment-20
Max. Time- 3 Hours

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Objective: It is an applied course of methods in urban geography which is aimed at providing knowledge about the data sources, methods and techniques to study different aspects of urban geography. It aims to inculcate basic research skill about the applications of various tools to study research problems related to various dimensions of urban geography.

Learning Outcomes: This course shall develop the basic understanding of students about applications of different methods and techniques and geospatial technology to study research problems related to urban geography

Unit I

Urbanisation: Stages of Urban Development, Contemporary Trend, Pattern and Characteristics of Urbanisation in South Asia, Classification of Settlement, Characteristics, Evolution and Growth, Morphology, Land-use Patterns and Functions, Spatial Organisation, Principal of Centrality and Hierarchy: Rank Size Rule, Primate City, Methods of Measuring Centrality, Central Place Region.

Unit II

Dimensions of Urban Studies in India, Urbanisation with Special Reference to India, Urbanism and Urban Change, Socioeconomic Consequences of Urbanisation: Employment, Urban Informal Sector, Urban Poverty and Malnutrition, Urban Issues and Challenges: Urban Structure; Urban Residential Problems; Slums; Solid Waste Disposal, etc. Urban Area & Climate Change: Water Demand & Supply, Urban heat Island, Flash Floods etc.

Unit III

Urban Governance and Institutional Framework in India; Basic Amenities in Urban Area & Associated Challenges; Urban Housing & Neighbourhood Change, Residential Segregation: Concept & theories, Urban Inequality, Methods and Techniques to Measure Urban Bias, Issues

of Urban Sustainability, GIS & Urban Morphology: Mapping, Visualisation and Geosimulation of Urban Land Use Cover, Characteristics & Mapping of Peri-urban Areas, Land Use Planning and Decision Support System.

Unit IV

Geospatial Technique in Urban Planning: Geosimulation & Land Use Pattern, Urban Growth Simulation, Methods and Techniques of the Extraction of Build-up Area (BAEM, SLEA, DMSP); Urban Sprawl Metrics, Landscape Metrics; Growth Prediction (Integration of CA – Markov Model & Artificial Neural Network); Livability Assessment (K Mean & Cluster Analysis & Entropy), Urban Utility Mapping, Simulating of LULC & Building Types, 3D Mapping and Modelling of Urban Areas, Participatory GIS, Virtual 3D Model for City Model Spatial Data Base of Cities.

Suggested Readings/References:

1. Arabi, U., Musthaf and Nagendra (2007). Urban Housing Policies in India: Strategies and Issues, Nagarlok, 39 (2), 32-60.
2. 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.
3. Bradford, M.G. and Kent, W.A. (1984). Human Geography: Theories and their Applications, Oxford.
4. Brenner, N. and Schmid, C. (2015). Towards a new epistemology of the urban?, City, 19 (2-3), 151-182
5. Carter, Harold (1995). The Study of Urban Geography, Edward Arnold, London
6. Cater, Harold (1972). The study of Urban Geography. London: Edward Arnold.
7. Chorley, R. J. and Hagget, P. (1970). Socio Economic Models in Geography. London: Methuen.
8. Cole, J.P and King, C.A.M. (1970). Quantitative Geography, John Wiley and Sons, New York
9. Das, A. K. (2007). Urban Planning in India, Rawat Publication, New Delhi
10. Dickinson, G.C. (1973). Statistical mapping and the presentation of statistics, Edward Arnold, London
11. Friedmann, J. (1986). The world city hypothesis, Development and Change, 17, 69-83
12. Gilbert, A. (1993). Third World cities: The changing national settlement system, Urban Studies, 30 (4/5): 721–740
13. Glaeser, E. L. (2008). Cities, Agglomeration and Spatial Equilibrium. Oxford University Press.
14. Graham S. and Marvin S., (2001). Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition, Routledge.
15. Hagget, P. (1971). Locational Analysis in Human Geography. New York: Martin's Press.

16. Hall, P. (1997): Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century, Wiley Blackwell, New Jersey
17. Hall, P. (2002): Urban and Regional Planning, Routledge, London and New York
18. Hall, T. (2006), Urban Geography, Taylor and Francis.
19. Hall, T. and Barrett, H. (2012): Urban Geography, Routledge, London and New York
20. Harvey, D. (1985). The Urbanization of Capital. Basil Blackwell, Oxford
21. Jiménez, B and Rose, J. (2009). Urban Water Security: Managing Risks. CRC Press, London, Newyork, Leiden, Boca Raton
22. Johnson, J. S. (1967), Urban Geography, An Introductory Analysis, Pergamen Press, London.
23. Johnson, J. (Eds.). (1974). Suburban Growth. London: John Wiley and Sons.
24. Johnston, R.J. et al (1983). The Dictionary of Human Geography, Basil Blackwell Publisher Limited, Oxford
25. K C Sivaramakrishnan, The Urban Question, Indian Institute of Advanced Study, 1978
26. Kitchen, R. and Tae, N. J. (2000). Conducting Research into Human Geography: Theory, Methodology and Prctice. London: Prentice Hall.
27. Knox P. L. and McCarthy L., (2005). Urbanization: An Introduction to Urban Geography, Pearson Prentice Hall, New York.
28. Knox P. L. and Pinch S., (2006). Urban Social Geography: An Introduction, Prentice Hall.
29. Kundu, A. (2009). Exclusionary Urbanisation in Asia: A Macro Overview, Economic and Political Weekly, 44 (48), 48-58
30. Kundu, A. (1980). Measurement of urban processes: A study in Regionalization, Popular Prakashan, New Delhi
31. Laboritz, S. and Hagedorn, R. (1971). Introduction to Social Research. USA: McGraw Hills.
32. Latham, A., McCormack, D., McNanara, K and McNeill, D. (2009). Key Concepts in Urban Geography. Sage, Los Angeles
33. Lipton, M. (1990). Why Poor People Stay Poor: Urban Bias in World Development, Harvard University Press, Harvard
34. Macionis, John J. and Vincent N. Parrillo (2017). Cities and Urban Life, Pearson, United States.
35. Mandal, R. B. (1979). Introduction to Rural Settlements. New Delhi: Concept.
36. Mathur, K. (2008). From Government to Governance: A Brief Survey of the Indian Experience, National Book Trust, India
37. Mayor, H. M. and Kohn, C. F. (1959). Readings in Urban Geography, University of Chicago Press, Chicago.
38. Michanel, P. (2004). Urban Geography: A Global Perspective. USA: Routledge.
39. Mumford, L. (1972). The City in History: Its Origins, Its Transformations, and Its Prospects, Harcourt Books, New York.

40. Myrdal, G. (1957). Economic Theory and Underdeveloped Regions, Gerald Duckworth, London
41. Northem, R. M. (1980). Urban Geography. London: Croom Helm.
42. Pacione, M. (2009). Urban Geography: A Global Perspective, Routledge, Taylor and Francis, London and New York.
43. Pugh, C. (1990). Housing and Urbanization: A Study of India, Sage Publication, New Delhi
44. Singh R. L. and Singh, K. N. (1975). Reading in Rural Settlement Geography, NGSI, Research publication no. 14, National Geographical Society of India, Varanshi.
45. Singh R. L. and Singh, R. P. B. (1980). Rural Habitat Transformation in World Frontiers, 24 IGC publication, Tokyo.
46. Ramachandra, R. (1992). Urbanization and Urban System in India. Oxford University Press, London.
47. Raymond and Murphy. (1960). American Cities: An Urban Geography. New York: McGraw Hills.
48. Rogerson, P. (2001). Statistical Methods for Geography, Sage Publications, London
49. Rostow, W.W. (1960). Stages of Economic Growth: A Non Communist Manifesto, Cambridge University Press, Cambridge
50. Sassen, S. (2001). The Global City: New York, London and Tokyo, Princeton University Press, Princeton.
51. Saxena, H. M. (2005). Transport Geography. Delhi: Rawat Publication.
52. Sinha, S. P. (1984). Processes and Pattern of Urban Development in India: A study of Haryana. Ambala Cantt: The Associated Publishers.
53. Venables, A. J. (2005). Spatial disparities in developing Countries: Cities, Region and International Trade, Journal of Economic Geography, 5 (1), 3-21.