

Central University of Punjab



Ph.D. Geography

Academic Session: 2021

Learning Outcome

The Ph.D. Geography Programme will enable the students to:

1. Formulate research problems in the field of geographical enquiry
2. Explore real world issues through research tools of geography
3. Review the thematic issues with research competencies.
4. Analyze various tools and techniques of data collection
5. Apply geographical research techniques in solving problem with spatial dimension.
6. Evaluate the validity of findings in research
7. Demonstrate research competencies in completion of dissertation in relevant themes at various scales.

Department of Geography

Syllabus for Ph.D. Course work in Geography					
Course Code	Course Title	Course type	Credit Hours		Cr
			L	P	
GEO.701	Research Methodology in Geography	Co	4	-	4
GEO.702	GIS & GPS (Practical)	SB	-	4	2
GEO.751	Research and Publication Ethics	Co	2	-	2
GEO.752	Teaching Assistantship		0	2	1
UNI.753	Curriculum, Pedagogy and Evaluation		1	0	1
Elective courses: Select any one of the specialized courses listed below					
GEO.704	Population, development, and environment	EL	4	-	4
GEO.705	Urban Geography and Environment	EL	4	-	4
GEO.706	Paleoclimatology	EL	4	-	4
GEO.707	Sustainable and Resilient city	EL	4	-	4
Total		CBCS	8	4	14

Choice Based Credit System (CBCS): **CF:** Compulsory Foundation, **Co:** Core, **SE:** Skill-based, **EL:** Elective **L:** Lecture, **T:** Tutorial, **P:** Practical, **Cr:** Credit

Evaluation Criteria

Evaluation criteria for Examination – Theory Paper
End Semester Examination- 100 marks

Evaluation criteria for Practical Examination			
End Semester performance	Practical copy	Viva	Total
60	20	20	100

Course Title: Research Methodology in Geography **L** **T** **P** **C**
Course Code: GEO.701 **4** **-** **-** **4**

Total Hour: 60 Hours

Learning Outcomes: student will competent to explore:

- Concept, theory, methods and tools in geographical research
- Types of data, data collection tools and methods
- Scientific thesis and research paper writing
- Research ethics, valuation and visualization

After completion of the course the students will learn:

- Types and methods of research
- How to review literature
- How to formulate research problem
- Methods of data collection
- Develop research problems
- Application of statistical techniques in research

Unit I: Research paradigm in geography **15 lectures**

- Concept, theory and types of geographical research
- Scientific research philosophy: Kuhn and David Harvey philosophy
- Scientific reasoning: inductive and deductive, empirical and general
- Geographical research: models and tools
- Discipline-wise geographical research: A survey

Unit II: Research procedure/Research design and methodology: **15 lectures**

- Research approach: qualitative, quantitative and mixed
- Research design: methods and tools
- Research process: steps in scientific research
- Research valuation: SWOT analysis, Cost-benefit analysis

Unit III: Methods of data collection and analysis **15 lectures**

- Concept and types of data and information
- Data collection instruments and process
- Data sources and data collection ethics
- Cloud-based and off-cloud data mining
- Applied geostatistics: descriptive and inferential geostatistics

Unit IV: Scientific thesis and paper writing **15 lectures**

- Scientific thesis writing: methods and tools
- Scientific paper writing: methods and tools
- Bibliography, referencing and citation: methods and tools
- Research ethics: copyright issues and plagiarism
- Guideline for theme-based journal articles

Transaction Mode: Lecture delivery using White Board and PPT, Problem Solving through Assignments.

Suggested readings:

1. Amedeo, D. and Golledge, R.G. (1975). An introduction to scientific reasoning in geography, New York, Willey and Sons.
2. Berg, Bruce L. (2001). Qualitative Research Methods for Social Sciences. Boston: Allyn and Bacon.
3. Brent, E. E. (1990). Computer Applications in the Social Sciences. Philadelphia: Temple University Press.
4. Bryant, Christopher G. A. and David Jary (eds). (1991). Giddens' theory of structuration: a critical appreciation. London: Routledge.

5. Chakravarti, A.K. & Tiwari, R.C. (1990). A Basic Research Paradigm in Geography, *Journal of Geography*, 89:2, 53-57, DOI: 10.1080/0022134 9008979595Sack, R. (1973).
6. Harvey, D. (1973). Explanation in Geography. *Historical Methods Newsletter*, 6(2), 68–72. doi:10.1080/00182494.1973.10593999
7. Robert, A. (2002). *Epistemology: A Contemporary Introduction to the Theory of Knowledge*. London: Routledge

Course Title GIS & GPS – P	L	T	P	C
Course Code: GEO.703	-	-	4	2

Total Hour: 60 Hours

Learning Outcomes: After completion of the course the students will learn:

- theoretical framework in geographical information system
- Types of datasets
- Extraction, generation, and analysing of data.
- digital cartography
- Learning of GIS software

Exercises

- Georeferencing Maps/Images,
- Digitization of Raster Map: Point, Line and Polygon Features,
- Preparation of Attribute Tables, Editing and Joining Tables,
- Analyzing Attribute Data: Calculating Area, Perimeter, and Length.
- Spatial Representation: Mapping Techniques,
- Spatial Representation: Symbolizing and Map Layouts, Basic
- Analysis in GIS: Buffering, Overlay and Query Building
- GPS Applications
- User interface with global positioning receivers
- Collection of ground control points using hand held GPS receiver
- DGPS, wide area augmentation system (WAAS)
- Transferring data from GPS receiver to PC.

Transaction Mode: Lecture, demonstration, tutorial, hands on exercise, problem solving.

1. Bhatta, B. (2011). *Remote sensing and GIS*, 2nd edition, New Delhi, Oxford University Press.
2. Harvey, F. (2016). *A primer of GIS: Fundamental geographic and cartographic concepts*, 2nd edition, New York, The Guilford press.
3. Hofmann-wellenhof, B., Lichtenegger, H., Collins, J., Hofmann-wellenhof, B. (2013). *GPS global positioning system: Theory and practice* 5th edition, New Delhi, Springer (India) private limited.
4. Kennedy, M. (2013). *Introducing geographic information systems with arcgis: A workbook approach to learning GIS*, 3rd edition, New Jersey, A John Wiley & Sons publications
5. Liu, Jian Guo & Mason, Philippa J. (2016). *Image processing and GIS for Remote Sensing, Techniques and applications*, 2nd edition Publication, United Kingdom, Wiley Blackwell.
6. Van Sickel, J. (2008). *GPS for land surveyors*, 3rd edition, London, CRC press

Thematic Papers (Select any one)

Course Title: Population, development and environment	L	T	P	C
Course Code: GEO.704	4			4

Total Hour: 60 Hours

Learning Outcomes: After completion of the course the students will learn:

- Population environment issues
- Critical appraisal of population theories
- Issues of inequality present at different scales
- Environmental issues with respect to human sustenance

Unit I **15 Hours**

- Concept: population, development and environment
- Theories: Malthus, marx, neo-malthusian and cornucopian

Unit II: **15 Hours**

- Demographic transition: stages, form and transformation
- Ageing: concept, measurement, global and Indian pattern, implications

Unit III: **15 Hours**

- Human development: component, measurement, distribution
- Poverty distribution
- Women and development: genders role, indicator of gender inequality, women and work participation, reproductive health

Unit IV: **15 Hours**

- Population and environment: climate change, global warming
- Food security
- Measurement: Vital rate, life table and population projection

Transaction Mode: Lecture, demonstration, tutorial, problem solving.

Suggested readings:

1. Council for Social development. (2006). India social development report OUP New Delhi.
2. Domash M. et al. (2001). Putting women in place, Gulliford press, New York.
3. Jain, D. (2005) women development and UN – A sixty years of quest for equality and justice, Indiana university press, USA
4. Newbold, B.K. (2006). Six billion plus: world's population in the 21st century, Rowman and Little field Pub. USA.
5. Ramakumar, R. (2018). Technical Demography, New Age International, New Delhi.
6. Saraswati R. et al. (1999). Atlas of women and man in India, Kali for women, New Delhi
7. Sialkind, N.J. (2006). Encyclopaedia of human development vol I, II,III sage new York.
8. Zukerman, B. et al. (1996). Human population and environmental crisis, Jone & Berlett, Boston.

Course Title: Urban Geography and Environment	L	T	P	C
Course Code: GEO.705	4			4
Total Hour: 60 Hours				

Learning Outcomes: After completion of the course the students will learn:

- Theories and approaches of urbanisation
- Different urban environmental issues of various scales
- National schemes/policies of urban development
- Themes of research in urban geography

Course Learning Outcomes:

The objective of the course are to develop an understanding of multiple theoretical perspectives on the city and to define, in multiple ways, the processes that constitute the city, its production. The students will also study various contemporary issues of urban areas from planning perspective. They will also understand the impact that urban policy of India has on cities.

Unit I **12 Hours**

Basic Concepts of Urban/Urbanization

- Nature and Scope of Urban Geography; Concept and theories
- Approaches to the study of Urban Geography
- Origin and growth of the cities
- Urban Environment: Concept, Components and Levels of Analysis
- Approaches to the study of Urban Environment; Global context of Urbanization and urban change.

Unit II: **18 Hours**

Emerging Issues

- Trends and Patterns of Urbanization in India: Pre and Post-Independence Period
- Functional Classification of Towns
- Urban Problems and Environmental Degradation in India; Micro Climate of Cities; Urban Pollution (Air, Water and Noise) and Health Impacts
- Rural-urban migration, Housing the urban poor, Poverty, power and politics
- Urban development policies of India

Unit III: **14 Hours**

Urban Environment

- Urban environment problems: Global and national;
- Concept of Urban Sustainability and Urban Environmental Conservation Strategies
- Traffic and transport problems
- Urban governance. Towards the city of the future.

Unit IV: **16 Hours**

Research Methods in Urban geography

- Models for Internal Structure, Hierarchy and Spacing of Cities;
- Urban Sprawl; Urban Poverty and Slums;
- Use of Remote Sensing Data for Urban Land uses and Change Detection; GPS and GIS for Urban Mapping
- Socio-economic and Environmental Surveys for Urban Themes.

Mode of Transaction: The course will be taught with a combination of lectures, discussion, and presentations, assignments, group learning exercise

Suggested readings:

1. Burgess, R., Marisa C., and Thed K. (1977). The Challenge of Sustainable Cities, Zed Books, New Jersey.
2. Carter, H. (1972). The Study of Urban Geography, Edward Arnold, London.
3. Choley, R.J.O. and Haggett, P. (1966). Models in Geography, Methuen, London.
4. Gibbs, J.P. (1961). Urban Research Methods, Princeton, New Jersey.
5. Goudie, A. (1993). The Human Impact on Natural Environment, Blackwell, USA.
6. Hall, P. (1992). Urban and Regional Planning, Routledge, London.
7. Knox, P. (1994). Urban Social Geography- An Introduction, Longman, U.K.
8. Nangia, S. (1976). Delhi Metropolitan Region: A Study in Settlement Geography, Rajesh Publications.
9. Pacione, M. (2009). Urban Geography: A Global Perspective. Routledge; 3 edition.
10. Ramachandran, R. (1997). Urbanization and Urban Systems in India. OUP India.
11. Yamagata, Y. and Yang, P. (2020). Urban Systems Design: Creating Sustainable Smart Cities in the Internet of Things Era. Elsevier Science Publishing Co Inc; 1 edition.
12. Yang, X. (2011). Urban Remote Sensing: Monitoring, Synthesis and Modelling in the Urban Environment. John Wiley and Sons Ltd.

Course Title: Paleoclimatology	L	T	P	Cr
Course Code: GEO.706	4	-	-	4

Total Hour: 60 Hours

Course objective: The goal of this course is to present an overview of the methods used to reconstruct the earth's climate history and the techniques used to determine the timing of environmental changes. Paleoclimate data from proxy records, such as ice cores or tree rings, provides a longer perspective on climatic variability than is possible from instrumental or historical records. Particular emphasis will be given to the climatic changes during the late Cenozoic – the time of the ice ages.

Learning outcome: The students would be able to identify climate forcing and responses over longer time scale.

- To discuss the various components of Earth's climate system, such as the cryosphere, atmosphere, biosphere, and hydrosphere.
- To discuss tools and techniques used to interpret changes in Earth's climate through geologic time.
- To recognize and critique modern paleoclimate studies through the use of primary literature in climate science.
- To examine the variable time scales upon which different climate processes occur and understands as residence time, and periodicity.

Unit I: Fundamentals of Paleoclimate: 10 Hours

- Introduction and Why Study Paleoclimate
- Overview of Climate Sciences
- Earth's Climate System Today
- Climate Archives, Data and Models

Unit II: Tectonic & Orbital-Scale Climate Change 20 Hours

Tectonic Scale Climate Change

- CO₂ and Long-Term Climate
- Gaia Hypothesis and Snowball Earth
- Plate Tectonic Drivers
- Greenhouse Climates, Greenhouse to Icehouse

- Paleoclimate Evidence from Oxygen Isotope Measurements

Orbital-Scale Climate Change

- Long term changes in the Earth's Orbit
- Orbital Parameters
- Changes in Insolation
- Ice ages, Ice Cores and Insolation Control of Ice Sheets
- North Hemisphere Ice Sheet History
- Orbital-Scale interactions

Unit III: Glacial/Deglacial & Human Climate Change

15 Hours

Glacial/Deglacial & Human Climate Change:

- The Last Glacial Maximum
- Climate Change since the last Deglaciation
- Millennial Oscillations of Climate

Human Climate Change:

- Early Humans and Climate Change
- Climate Change over the last 1,000 years
- Climate Change since 1850
- Current and Future Climate Change

Unit IV: Techniques of Paleoclimate Research:

15 Hours

- Introduction to geochronology techniques
- Theory and Applications of Luminescence Dating
- Theory and Applications of Dendrochronology Dating
- Essential field techniques used in Paleoclimate research, including remote sensing, surveying, mapping, and sediments/sample collections & coring.

Transaction mode: Lecture, Demonstration, Problem solving, Tutorial, Seminar, Local field visit discussion. Tools used: PPT, video, animation movie, whatsapp and Expert's Vedio Conferencing lectures from JNU, New Delhi, PRL-Ahmedabad, IUAC-Delhi, BSIP-Lucknow

International to National to Local reachability: The course will be further enhanced with the advice of experts from following international to national organizations

- Queens University, Belfast, Northern Ireland (U.K.) (World Famous lab of Carbon Dating)
- Department of Marine, Earth and Atmospheric Sciences, North Carolina State University (US)
- Johannes Gutenberg University, Mainz (Germany)
- Physical Research Laboratory, Deptt. Of Space, Ahmedabad (India)
- Birbal Sahni Institute of Palaeosciences, DST, Lucknow (India)
- Jawaharlal Nehru University, New Delhi (India)
- National Institute of Hydrology, Roorkee (India)
- Inter-University Accelerator Centre (IUAC), New Delhi (India)

Suggested Readings:

- Cronin, Thomas M. (1999). Principles of Paleoclimatology. Columbia University Press.
- Gornitz, Vivien. (2009). Encyclopaedia of Paleoclimatology and Ancient Environments. Springer Netherlands.
- Gilbert, Loren (2012). Paleoclimatology: Understanding Past Climate.
- Bradley, Raymond S. (2014). Paleoclimatology: Reconstructing Climates of the Quaternary: Third Edition.

Course title: Sustainable and Resilient city	Cr	T	P	Cr
Course code: GEO.707	4	-	-	4

Total hour: 60

Course objective: to introduce concept, planning framework and instrument and to explore the role of remote sensing and GIS for sustainable and resilient city. To develop student as urban planning professionals for competitive global job opportunities.

Learning outcome:

- Student will be proficient to comprehend concept, framework and planning instrument
- Hands on practice on the use of geoinformation science for sustainable and resilient city at national to global context.
- Student will be professional to carry out independent research on contemporary Sustainable and Resilient city challenges.

Unit I: Introduction to Sustainable City **15 Hours**

- Concept and theory of sustainable city
- Planning framework for sustainable city
- Indicators of sustainable city
- Sustainable city at local to global context

Unit II: Introduction to Resilient City **15 Hours**

- Concept and theory of resilient city
- Planning instruments for resilient city
- Climate resilient city
- Resilient city at local to global context

Unit III: Sustainable City **15 Hours**

- Introduction of Geoinformation science for sustainable city
- Geoinformation database management for sustainable city
- Geostatistics for sustainable city
- GIS-Based models for sustainable city

Unit IV: Resilient City **15 Hours**

- Geoinformation science for resilient city
- Geoinformation database management for resilient city
- Geostatistics for resilient city
- GIS-Based multi-scenario models for resilient city

Mode of Transaction: methods of transaction are lecture, audio-video, discussion which will be followed in teaching using ppt, WhatsApp etc.

Suggested readings:

- Kemp, R. & et al. (2005). Governance for sustainable development: moving from theory to practice, *Int. J. Sustainable Development*, 8(1/2), 12-30.
- Ness, B. & et al. (2007). Categorising tools for sustainability assessment, *Ecological Economics*, 60, 498–508.
- Sharifia, A., & Yamagata, Y. (2014). Resilient Urban Planning: Major Principles and Criteria, *Energy Procedia*, 61, 1491-1495.
<https://doi.org/10.1016/j.egypro.2014.12.154>.
- Zhang, X. & Li, H. (2018). Urban resilience and urban sustainability: What we know and what do not know? *Cities*, 74(A), 141-148.
<https://doi.org/10.1016/j.cities.2017.08.009>

Course Code: GEO.751

Course Title: Research and Publication Ethics

L	T	P	Credits
2	0	0	2

Total Hours: 30

Unit I Philosophy and Ethics

3 hours

- Introduction to Philosophy : definition, nature and scope, content, branches
- Ethics : definition, moral philosophy, nature of moral judgements and reactions

Unit II Scientific Conduct

5 hours

- Ethics with respect to science and research
- Intellectual honesty and research integrity
- Scientific misconducts : Falsification, Fabrication, and Plagiarism (FFP)
- Redundant publications : duplicate and overlapping publications, salami slicing
- Selective reporting and misrepresentation of data

Unit III: Publication Ethics

7 hours

- Publication ethics : definition, introduction and importance
- Best practices/ standards setting initiatives and guidelines: COPE, WAME, etc.
- Conflicts of interest
- Publication misconduct : definition, concept, problems that lead to unethical behaviour and vice versa, types
- Violation of publication ethics, authorship and contributor ship
- Identification of publication misconduct, complaints and appeals
- Predatory publishers and journals

Unit IV Open Access publishing

4 hours

- Open access publications and initiatives
- SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies
- Software tool to identify predatory publication developed by SPPU
- Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer, Journal Suggester etc.

Unit V Publication Misconduct

4 hours

- Group Discussions: Subject specific ethical issues, FFP, authorship; conflicts of interest; complaints and appeals: examples and fraud from India and abroad

- Software tools: Use of plagiarism software like Turnitin, Urkund and other open source software tools

Unit IV Databases and Research Metrics

7 hours

- Databases: Indexing databases; Citation database: Web of Science, Scopus etc.
- Research Metrics: Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score; Metrics : h-index, g-index, i10 index, almetrics

Course Code: GEO.752

Course Title: TEACHING ASSISTANTSHIP

L	T	P	Credit
0	0	2	1

Total Hours: 30

Learning Outcome:

At the end of this skill development course, the scholars shall be able to

1. familiarize themselves with the pedagogical practices of effective class room delivery and knowledge evaluation system
2. manage large and small classes using appropriate pedagogical techniques for different types of content

Activities and Evaluation:

- The scholars shall attend Master degree classes of his/her supervisor to observe the various transaction modes that the supervisor follows in the class room delivery or transaction process one period per week.
- The scholars shall be assigned one period per week under the direct supervision of his/her supervisor to teach the Master degree students adopting appropriate teaching strategy(s).
- The scholars shall be involved in examination and evaluation system of the Master degree students such as preparation of questions, conduct of examination and preparation of results under the direction of the supervisor.
- At the end of the semester, the supervisor shall conduct an examination of teaching skills learned by the scholar as per the following evaluation criteria:
- The scholars shall be given a topic relevant to the Master degree course of the current semester as his/her specialization to prepare lessons and deliver in the class room before the master degree students for one hour (45 minutes teaching + 15 minutes interaction).
- The scholars shall be evaluated for a total of 50 marks comprising content knowledge (10 marks), explanation and demonstration skills (10 marks), communication skills (10 marks), teaching techniques employed (10 marks), and classroom interactions (10).

Course Code: UNI.753

Course Title: CURRICULUM, PEDAGOGY AND EVALUATION

L	T	P	Credit
1	0	0	1

Learning outcomes:

Total Hours: 15

After completion of the course, scholars shall be able to:

- analyze the principles and bases of curriculum design and development
- examine the processes involved in curriculum development
- develop the skills of adopting innovative pedagogies and conducting students' assessment
- develop curriculum of a specific course/programme

Course Content

Unit I Bases and Principles of Curriculum

4 hours

1. Curriculum: Concept and Principles of curriculum development, Foundations of Curriculum Development.
2. Types of Curriculum Designs- Subject centered, learner centered, experience centered and core curriculum. Designing local, national, regional and global specific curriculum. Choice Based Credit System and its implementation.

Unit II Curriculum Development

4 hours

1. Process of Curriculum Development: Formulation of graduate attributes, course/learning outcomes, content selection, organization of content and learning experiences, transaction process.
2. Comparison among Interdisciplinary, multidisciplinary and trans-disciplinary approaches to curriculum.

Unit III Curriculum and Pedagogy

3 hours

1. Conceptual understanding of Pedagogy.
2. Pedagogies: Peeragogy, Cybergogy and Heutagogy with special emphasis on Blended learning, Flipped learning, Dialogue, cooperative and collaborative learning
3. Three e- techniques: Moodle, Edmodo, Google classroom

Unit IV Learners' Assessment

4 hours

1. Assessment Preparation: Concept, purpose, and principles of preparing objective and subjective questions.

2. Conducting Assessment: Modes of conducting assessment – offline and online; use of ICT in conducting assessments.
3. Evaluation: Formative and Summative assessments, Outcome based assessment, and scoring criteria.

Transaction Mode

Lecture, dialogue, peer group discussion, workshop

Evaluation criteria

There shall be an end term evaluation of the course for 50 marks for duration of 2 hours. The course coordinator shall conduct the evaluation.

Suggested Readings

- Allyn, B., Beane, J. A., Conrad, E. P., & Samuel J. A., (1986). Curriculum Planning and Development. Boston: Allyn & Bacon.
- Brady, L. (1995). Curriculum Development. Prentice Hall: Delhi. National Council of Educational Research and Training.
- Deng, Z. (2007). Knowing the subject matter of science curriculum, Journal of Curriculum Studies, 39(5), 503-535. <https://doi.org/10.1080/00220270701305362>
- Gronlund, N. E. & Linn, R. L. (2003). Measurement and Assessment in teaching. Singapore: Pearson Education
- McNeil, J. D. (1990). Curriculum: A Comprehensive Introduction, London: Scott, Foreman/Little
- Nehru, R. S. S. (2015). Principles of Curriculum. New Delhi: APH Publishing Corporation.
- Oliva, P. F. (2001). Developing the curriculum (Fifth Ed.). New York, NY: Longman
- Stein, J. and Graham, C. (2014). Essentials for Blended Learning: A Standards-Based Guide. New York, NY: Routledge.

Web Resources

- https://www.westernsydney.edu.au/__data/assets/pdf_file/0004/467095/Fundamentals_of_Blended_Learning.pdf
- <https://www.uhd.edu/academics/university-college/centers-offices/teaching-learningexcellence/Pages/Principles-of-a-Flipped-Classroom.aspx>
- <http://leerwegdialoog.nl/wp-content/uploads/2018/06/180621-Article-The-BasicPrinciples-of-Dialogue-by-Renate-van-der-Veen-and-Olga-Plokhooij.pdf>