Annexure-IV

DEPARTMENT OF GEOGRAPHY, M.D. UNIVERSITY, ROHTAK

Scheme of Examination

Ph.D. Course Work in Geography

(As per Credit System w.e.f. the academic year 2025-26)

Ph.D. Coursework shall be of one semester duration. The credit requirement for Ph.D. course work shall be of 12 credits (1 credit equals to 25 marks) in all comprising 2 courses of 4 credits each and two courses of 2 credits each. The student will complete the course Research and Publication Ethics of two credits from the common pool of the university.

SEMESTER - I						
Course Code	**Nomenclature of Course**	**Theory marks (end semester examination)**	**Internal Assessment marks**	**Maximum marks**	**Hours /Week**	**Credits**
23GEOPH11C1	Research Methodology in Geography	70	30	100	4	4
23CCPH11C1	Research and Publication Ethics*	-	-	50	-	2
23GEOPH11C2	Spatial Information Technology	70	30	100	4	4
23GEOPH11C3	Practical: Advance Computer Based Techniques in Geography	35	15	50	4	2
Total Marks/Credits				**300**		**12**

Note: *The student will complete the compulsory course i.e. **"Research and Publication Ethics"** of two credits from the common pool of the university as per university guidelines at university level.

Name of the Program	Ph.D. Course work in Geography	Program Code	GEOPH
Name of the Course	Research Methodology in Geography	Course Code	23GEOPH11C1
Hours/Week	4	Credits	4

Note: Max. Marks =100

Marks Distribution:

- Written test 2x15=30
- MCQ/QUIZZES/ Group Discussion 2x10=20
- Case study/ Mini project 1x25=25
- Seminar / Presentation 2x10=2
- Attendance 05

Course Objectives:

1. Knowledge creation executing research in physical and human domains of Geography.
2. The students learn to identify, formulate, review research literature, and analyse research problems.
3. They develop the skills of sound technique of precise, objective and ethical writing.
4. The students are trained in data management-collection (primary, secondary and tertiary data sources) analysis and interpretation of data.
5. The research findings/ writings strengthen the discipline and its teaching.

Course Outcomes:

1. Know fundamentals of research with a focus on raising geographic questions and parameters of geographic perspective.
2. Develop an understanding in identification and formulation of research problem on theme in geographic spirit and learn data management.
3. Be aware of various types and sources of data.
4. The students can prepare sampling design and sampling frame for collection of data. They are aware of the nature of research in qualitative/quantitative mode in geography.
5. Familiarize with research writing process and produce a quality thesis.

Unit – I

Research: Nature, meaning and types; Geographic research and choice of approaches: Geographic perspective: nature of Geography, Perspectives in Geographic research, Research ethics

Unit – II

Issues pertinent to thesis in Geography: Research proposal: Issues and formulation; Literature search and review of published research in relevant area

Unit – III

Significance of use of data in Geography; Generation of primary data; Sampling- Sampling design; Gathering of Secondary data; Gleaning of tertiary data

Unit - IV

Data representation; Data Interpretation; Research writing; Plagiarism; Preparing for viva-voce

References:

1. Booth, Wayne C., Gregory G. Colomb, and Joseph M. Williams. (2008). *The Craft of Research.* 3rd ed. Chicago: University of Chicago Press.
2. Booth, Wayne C., Gregory G. Colomb, and Joseph M. Williams. (2013). *A manual for Writers.* 8th ed. Chicago: University of Chicago Press.
3. Clifford, Nicholas J. and Gill Valentine (2003), *Key Methods in Geography*. London: Sage.
4. Gunning, R. (1952). *The Technique of Clear Writing.* New York: McGraw-Hill.
5. Krishan, Gopal and Nina Singh. (2020). *Researching Geography: The Indian Context*. 2nd ed. London: Routledge.

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Name of the Course	Research Methodology in Geography	**Course Code**	23GEOPH11C1
Hours/Week	4	**Credits**	4

Note: Max. Marks =100

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- Written test 2x15=30
- MCQ/QUIZZES/ Group Discussion 2x10=20
- Case study/ Mini project 1x25=25
- Seminar / Presentation 2x10=2
- Attendance 05

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1/4/2026 1/4/2026 01.04.2026 01/4/2026 01/04/26

Name of the Program	Ph. D. Course Work in Geography	**Program Code**	GEOPH
Name of the Course	Spatial Information Technology	**Course Code**	23GEOPH11C2
Hours/Week	4	**Credits**	4

Note: Max. Marks =100

Marks Distribution:

- Written test 2x15=30
- MCQ/QUIZZES/ Group Discussion 2x10=20
- Case study/ Mini project 1x25=25
- Seminar / Presentation 2x10=20
- Attendance 05

Learning Objectives

1. To expose students to the basic concepts of Spatial Information Technology
2. To enable the students to apply their knowledge in the interpretation of Remote Sensing Data.
3. To impart knowledge in image fundamentals and mathematical transforms necessary for image processing
4. To enable the students to understand GIS techniques for their best use.
5. To make the students conversant in the use spatial technology.

Course Outcomes:

- Upon completion of this course, students will be able to analyze general terminology of spatial information science.
- Develop an understanding in identification and formulation of GIS based research problems.
- Student will also have sufficient expertise in its wide range of applications.
- It will provide ability to function on multidisciplinary teams.
- To produce skilful graduates to analyze, design and develop a system/component/ process for the required needs under the realistic constraints.

Unit – I

Introduction to Spatial Information Technology: Definitions and Component of SIT; Historical Developments; Integration of Remote Sensing, GIS and GNSS Technologies; Application of SIT.

Unit – II

Remote Sensing and Digital Image Processing: Spectral Reflectance Curve- Vegetation, Soil and Water; Digital Image Processing- Atmospheric, Radiometric and Geometric Corrections; Image Enhancements techniques.

Unit – III

Geographical Information System: Data Base Management System; Spatial Analysis; Trends in GIS; Mobile GIS.

Unit - IV

Global Navigation Satellite System: GNSS Systems; Principle of GNSS Operation; Sources of Errors; GNSS Augmentation Systems.

References:

1. Kumar D., Singh R.B. and Kaur R., (2019). *Spatial Information Technology for Sustainable Development Goals,* Springer International Publishing.
2. Peter J.G. Teunissen and, Oliver M. (Eds.), (2019). *Springer Handbook of Global Navigation Satellite Systems,* Springer International Publishing
3. Kron G., (2017). *Global Navigation Satellite Systems: Signal, Theory & Applications,* Scitus Academics.
4. Heywood, I., Cornelius, S., Carver, S. (2011). *An Introduction to Geographic Information Systems,* 4 th Edition, Pearson Education.
5. Lillesand, T.M., Kiefer, R.W. and Chipman, J.W. (2004). *Remote Sensing and Image Interpretation,* 5th Edition, Wiley.

Name of the Program	Ph.D. Course work in Geography	Program Code	GEOPH
Name of the Course	Advanced Computer Based Techniques in Geography	Course Code	23GEOPH11C3
Hours/Week	4	Credits	2

Note: Max. Mark =50

Marks Distribution:

- Regular assessment through observation and class discussion 10
- Lab Work (Practical file)/ Field Work (Report)/ Mini Project 20
- Seminar/ Presentation 2x7.5= 15
- Attendance 05

Learning Objectives:

The course designed to:

1. Impart adequate professional knowledge and computer skill.
2. Enhance the understanding about computer-based techniques in Geography.
3. Develop the skill of analyse data scientifically.
4. Familiarize students with soft wares for better research.
5. introduce GIS and SPSS software's

Course Outcomes:

Students would be able to:

1. Know the scientific tools in research.
2. Understand computer basics.
3. Understand data analysis scientifically.
4. Have the skill of spatial data handling and processing in GIS.
5. Have the skill of effective decision making and real-world problem solving.

Unit – I

Basics about Excel: Table, formatting, sorting and filtering; use of basic formulae; random number generation; statistical charts (line graphs, bar diagrams, scatter diagram, control charts, histogram etc.). SPSS Environment: entering data into data editor; Pearson product moment correlation. Linear regression analysis

Unit – II

Introduction GIS technology: Spatial data import and export in GIS; Raster & Vector data structure models; Raster and Vector overlay analysis; Buffer analysis, Spatial interpolation: IDW and Kriging methods, Surface modelling: DTM; DEM, Image enhancement techniques: Linear and non-liner contrast stretch; histogram equalisation and density slicing.

Suggested Readings:

1. Bhatta B. (2023). *Remote Sensing and GIS*, Oxford University Press, New Delhi.
2. Chang, K.T. (2019). *Introduction to Geographic Information Systems*, Tata McGraw-Hill Publishing Company Ltd, New York.
3. Gibson, P.J. & Power, C. H. (2000). *Introductory Remote Sensing: Digital Image Processing and Applications*, Routledge, London.
4. Reddy, M. A. (2012). *Remote Sensing and Geographic Information Systems,* B S Publications, Hyderabad
5. Walford N. (2002). Geographical Data Characteristics and Sources, John Wiley & Sons; Ltd. West Sussex, England.

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