DEPARTMENT OF GEOGRAPHY

SEMESTER VIII

Category II

Geography Courses for Undergraduate Programme of study with Geography as one of the Core Disciplines

(B.A. Programmes with Geography as Major discipline)

DSC-14 A

DISCIPLINE SPECIFIC CORE COURSE

INTRODUCTION TO GEOSPATIAL TECHNOLOGIES (PRACTICAL)
(DSC 14 A)

Course title & Cod	Credits	Credit distribution			Eligibility Criteria	Prerequisite
		Lecture	Tutorial	Practical/ Practice		
Introduction to Geospatial Technology (PRACTICAL) DSC14A	**4**	**2**	**0**	**2**	**Passed Class 12th**	**NIL**

Learning Objectives

The learning objectives of this course are as follows:

- In this Course, the students will get a basic understanding of the fundamentals of Remote Sensing, its definition, platforms, sensors, and resolution.
- Students will gain knowledge about both spatial and non-spatial data, data structures and GIS data analysis.
- Students will gain hands on experience in determining location-specific data using GPS.
- Students will learn the fundamental steps in change detection analysis and the application of Remote Sensing and GIS to the geographical study of Land Use Land cover, Natural Resource Management, Urban Studies and Disaster Management.

Learning Outcomes

Through this course, the students would gain an understanding of Geospatial Technologies, and when completed, they would be able:

- To comprehend concepts related to Remote sensing, GIS and GPS.
- To develop a basic understanding of the metadata of the satellite data and have a hands-on experience with different steps of its visual interpretation.
- To understand GPS technology and its importance in geographical studies.
- To learn to apply basic GIS operations/skills to detect both spatial and temporal changes in land use/cover, natural resources management, urban studies, and disaster management.

Course Outline

Unit I: FUNDAMENTALS OF REMOTE SENSING (Theory: 15 hours)

- Definition, Stages of Remote Sensing
- Types of Remote Sensing Platforms
- Sensors (LANDSAT and IRS)
- Resolution: Spectral, Spatial, Temporal, and Radiometric Resolution.

UNIT 2: GEOGRAPHICAL INFORMATION SYSTEM (GIS) AND GLOBAL POSITIONING SYSTEM (Theory: 15 hours)

- Definition and Components of GIS, Overview of GIS software
- Types of Data: Spatial and Non -Spatial Data, Types of Data Structure: Raster and Vector
- Fundamentals of GPS, Segments of GPS
- Global Navigation Satellite Systems (NavIC, NAVSTAR)
- GPS technology in Geographical studies

UNIT 3: SPATIAL DATA INPUT AND EDITING (Practical- Lab Based: 30 hours)

- Spatial Data Sources and Downloading
- Visual Interpretation and Metadata analysis of Satellite Image
- GIS inputs: Georeferencing and Digitization
- GPS based determination of Way points and Tracking routes

UNIT 4: APPLICATION OF REMOTE SENSING AND GIS (Practical- Lab Based: 30 hours)

- Land Use and Land Cover mapping
- Urban Sprawl analysis
- Mapping for Disaster Management (floods and landslides)

References:

Campbell, J. C., and Wynne, R. H. (2022) Introduction to Remote Sensing, 5th ed. The Guilford Press. New York 622p.

Jenson, J.R. (2000). Remote Sensing of the Environment – An Earth Resource Perspective, Prentice Hall Inc.

Lillisand, T. M. and Keifer, R. W. (2011)). Remote Sensing and Image Interpretation',3rd Edition John Willey and Sons, New York.

Sabins, F.F. (2007) Remote Sensing: Principles and Interpretation, 3rd Edition, Waveland Pr, Inc ,ISBN-13-978-1577665076

Burrough, P.A., McDonnell, R.A. and Lloyd, D. McDonnell (2016). Principles of Geographical Information Systems, UK: Oxford University Press.

DeMers M. N., 2000: Fundamentals of Geographic Information Systems, NJ, USA: John Wiley & Sons.

Nag, P. (2008). Introduction to GIS. New Delhi, India: Concept.

Sarkar, A. (2015) Practical geography: A systematic approach. New Delhi, India: Orient Black Swan Private Ltd.