

Core IV

Cartography and Geo-Spatial Techniques

Unit-I:

Learning Outcome:

Develop the ability to design and produce effective and aesthetically appealing maps using modern cartographic techniques and software. They will understand principles of cartographic design, color theory, and typography to create maps that convey spatial information clearly and accurately.

Scientific basis of Cartography, needs of map making, characteristics of maps, Geographical Coordinates (Latitude and Longitude), Graticules, types of Scales (Plain, and Diagonal Scale.)

Unit-II

Learning Outcome:

Acquire knowledge in selecting and applying appropriate map projections for representing geographical data accurately, as well as mastering the skills to create and interpret dip strike maps to analyze geological structures effectively.

Meaning, Uses and types of Map Projection, Transformation of area, Distance and Direction, Choice of map projection, Interpretation of Bedding plane, Strike, Dip, structure & stratigraphy of Geological map, methods of determination of slope (Wentworth's method and Smith).

Unit-III

Learning Outcome:

Gain proficiency in using GIS software to capture, store, manipulate, and analyze geospatial data. They will learn how to integrate various data layers, perform spatial queries, and create interactive maps to solve real-world geographical problems.

History of Geographical Information System, Components of GIS, Dimensions of GIS data- Conceptual (field/object) and logical (raster/vector), Data sources, data types (raster/vector/attribute), History of Remote Sensing, Types of Platform, Sensor characteristics, Aerial photographs and Visual interpretation of Satellite images, Global Positioning System (GPS) and Global Navigation Satellite System (GNSS), Applications of GIS and RS.

Unit-IV: Practical

Learning Outcome:

Acquire hands-on cum practical skills in using modern cartographic tools and geospatial technologies to create visually compelling maps and effectively analyze spatial data for various applications in geography, environmental studies, and other related fields.

1. Construction of Graphical, RF & Statement Scale, Diagonal Scale
2. Construction of Map Projections: Cylindrical and Conical Projection with one and two standard parallels and Zenithal.
3. Drawing of Choropleth and isopleth maps,
4. Slope Analysis (Wentworth's method).
5. Identification and mapping of water bodies from satellite imageries
6. Digitization of map and drawing of few point, line and polygon features.
7. Practical record and viva-voce

Text Books:

- ✓ Mishra R.P. and Ramesh, A., (1989) *Fundamentals of Cartography*, Concept, New Delhi.
- ✓ Monkhouse F. J. and Wilkinson H. R. (1973). *Maps and Diagrams*. Methuen, London.

Reference Books:

- ✓ Anson R. and Ormelling F. J., 1994: *International Cartographic Association: Basic Cartographic Vol. Pregmen Press*.
- ✓ Burrough, P. A. Donnell, & Rachael, Mc. (1998). *Principles of Geographical Information Systems' Oxford University press, New York*.
- ✓ Burrough, P.A., (1986). *Geographical Information System for land Resources System. Oxford Univ. Press, UK*.
- ✓ Bhatta, B. (2008). *Remote Sensing and GIS. Oxford University Press, New Delhi*.
- ✓ Lillesand and T. M., Kiefer R. W. and Chipman J. W. (2004). *Remote Sensing and Image Interpretation. Wiley*.
- ✓ Magwire, D.J. Goodchild, M.F. and Rhind, D.M. (2005). *Geographical Information Systems: Principles and Applications. Longman Group, U.K*
- ✓ Lo, C.P. & Yeung, A. K.W. (2006). *Concepts and Techniques of Geographic information Systems. Prentice Hall of India, New Delhi*.
- ✓ Robinson A. H. (2009). *Elements of Cartography. John Wiley and Sons, New York*.
- ✓ Sarkar, A. (2015). *Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi*.
- ✓ Singh, R. L. & Singh R. P. B. (1999). *Elements of Practical Geography. Kalyani Publishers*.