

### **GIE 457: GEOINFORMATICS (OPEN ELECTIVE)**

<b>Unit 1</b>	<b>Definition</b> of data and information, historical evolution and need for information, Basic Concepts of Spatial Data and a spatial data, spatial information. sources of spatial data- survey data, air photos, satellite images and field data	6 hrs
<b>Unit 2</b>	Scope and Importance of Geoinformatics; Basic concepts of remote sensing; aerial photography and satellite remote sensing. Indian Space Program and Indian remote sensing satellites	6 hrs
<b>Unit 3</b>	<b>Principles of Thermal and Microwave Remote Sensing:</b> Introduction, Black body radiation, Temperature Radiations from the earth's surface, Applications of thermal remote sensing. Basic concepts of microwave remote sensing, Real Aperture Radars and Synthetic Aperture Radars, Microwave sensors, Interferometry. Applications of Microwave Remote Sensing. Visual and digital image analysis techniques.	6 hrs
<b>Unit 4</b>	Map Concept: Map features, scale, resolution, accuracy, projection and database extent. Map Projection and parameters: Geographical co-ordinate system, spheroid and spheres. Types of projection and parameters. Indian geodetic system and Everest spheroid, world geodetic system -084 (WGS-084)	6 hrs
<b>Unit 5</b>	Geographic Information System: Definition, components, packages, capabilities and purpose of GIS. Data Models: Spatial and non-spatial databases. Vector and Raster models. Application and limitations of GIS	6 hrs
<b>Unit 6</b>	Fundamentals of GPS- Introduction, space segments, user segments and control segments, observation principle and signal structure, accuracy of GPS measurements, point positioning and relative positioning, methods of surveying with GPS, Static and Kinematic positioning, navigation with GPS, differential GPS, navigational receivers	6 hrs
<b>Unit 7</b>	Geoinformatics and other Information Sciences. Geoinformatics-Spatial and Non –Spatial data Management. Spatial information Technology	6 hrs
<b>Unit 8</b>	Applications of Geoinformatics: Geoinformatics technologies and the technologies used in Geographical Studies.	6 hrs

### **References**

1. Goodchild M.F. and Kemp K – ‘Developing a curriculum in GIS: The NCGIA Core Curriculum Project’, University of California, Santa, Barbara 1990.
2. Ian Haywood Cornelius and Steve Carver – An introduction to GIS, Longman, New York, 2000.
3. Misra HC – A Handbook on GIS, GIS India, Hyderabad, 1995.
4. Smith T.R. and Piquet, GIS, London Press, London, 19085.
5. Taylor DRF – GIS: The Micro computer and Modern Cartography, Pergamon Press, Oxford, 1991.

6. Heywood I, et al, An Introduction to Geographical Information System,
7. Longman, New Delhi, 19908.
8. 7. Lo CP & Young AKW, Concepts & Techniques of Geographical Information
9. Prentice Hall of India, New Delhi – 2003.