

CE551: GIS and GPS in Civil Engineering

Teaching Scheme			Credits	Marks Distribution				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE	CE	ESE	CE	
3	0	2	5	70	30	30	20	150

Course Content:

Sr. No.	Topics	Teaching Hrs.
1	<p><u>Introduction:</u></p> <p>Geographical Concepts and Terminology, Difference between Image Processing System and Geographic Information System (GIS), utility of GIS, various GIS packages and their salient features, Essential components of a GIS.</p>	06
2	<p><u>Data Acquisition:</u></p> <p>Scanners and Digitizers, Method of Digitization, Raster and Vector Data, Data Storage, Verification and Edition. Data Preprocessing; Format Conversion, Data Compression, Data Reduction and Generalization, Run Length Coding, Merging, Edge Matching, Rectification and Registration, Interpolation.</p>	06
3	<p><u>Data Base Structure:</u></p> <p>Hierarchical Data, Network Systems. Relation Database. Data Management -Conventional Database Management Systems, Spatial Database Management.</p>	06
4	<p><u>Data Manipulation and Analysis:</u></p> <p>Reclassification and Aggregation, geometric and Spatial Operations on Data Measurement and Statistical Modeling. Data Output – Types of Output. Application of GIS in various Natural Resources Mapping & Monitoring, Engineering Application.</p>	12

- 5 Introduction to Global Navigation Satellite System, Introduction to GPS, GPS Segments: Space, Control and User segments. GPS principles, receiver types and positioning techniques. 12

GPS applications in Transportation Engineering: Intelligent Transport System, Mass transport system and location based services.

GPS applications in Construction Management: Location based material and equipment management.

Total Hrs. 42

Reference Books:

1. P.A. Borrough, "*Principles of Geographic information Systems for Land Resources Assessment*", Oxford University Press, 1986.
2. Manual of Remote Sensing Vol. 2, American Society of Photogrammetry and Remote Sensing.
3. Stan Aronoff, "*Geographic Information Systems: A Management Perspective*", WDL Publications, 1991.
4. Dr. Chandra A.M., "*Remote Sensing and GIS*", Narosa Publishers, New Delhi.
5. B. Bhatta, "*Remote Sensing and GIS*", Oxford University Press, New Delhi.