MCA- E310 Remote Sensing and GIS				
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Course objective:

1. To provide exposure to students in gaining knowledge on concepts and applications leading to modeling of Natural Resources, Man-made Objects, Agriculture and management using Remote Sensing and GIS
2. To enhance programming and tool handling skills in preparing, storing, modeling, managing digital data for planning and development
3. To provide maximum opportunities to get the job in RS and GIS based software industries, institutions, consultancies etc.
4. To acquire skills in advance techniques such as multispectral, hyper spectral, thermal and LiDAR imaging, scanning, processing for mapping, modeling and monitoring

Course outcomes:

1. Fully equipped with concepts, methodologies and applications of Remote Sensing and GIS Technologies
2. Acquire skills in handling software, programming, instruments, tools, techniques and modeling while using Remote Sensing and GIS Technologies.

Statistical Mathematics: Basics of Statistics for Image Processing, Regression, Least Square Analysis & Probability Distributions

Remote Sensing (Remote Sensing): RS Data Acquisition Mechanism, Satellites, GPS, Introduction to Satellite Image Processing, Image Formats and Properties, Image Preprocessing, Image Enhancement, Image Classification, Image Fusion, LU/LC, Change Detection, Multispectral and Hyperspectral Remote Sensing, Basics of Satellite Photogrammetry, Microwave and LiDAR Remote Sensing.

GIS (Geographical Information System): Introduction to Geographic Information Systems (GIS), Spatial Data, Vector Data, Raster Data, GIS Software and Application, Digital Image Processing in GIS, Geospatial Database Generation, Spatial Data Analysis with GIS, Web GIS, Technology and Trends in GIS.

Applications (EARDAS/ENVI/QGIS): Satellite Image Representation (Pixel and Object), Image Subset, Image Preprocessing, Layer Staking, ROI, Development of Spectral Signatures, Image Compression, Image Classification (Supervised and Unsupervised) and Image Post Classification. GPS Survey, Creation of Vector Layers in QGIS, Geo-referencing and Projection, Spatial Data Analysis, Vector Data Analysis, Raster Data Analysis, Map Composition, Network Routing, Multi-Criteria Analysis, Demo on Unmanned Aerial Vehicle

Recommended Books:

1. Basudeb Bhatta, Remote Sensing and GIS, Oxford Press
2. Thomas Lillesand, Ralph W. Kiefer, Jonathan Chipman, Remote Sensing and Image Interpretation, John Wiley & Sons
3. Gary Sherman, The PyQGIS Programmer's Guide: Extending QGIS 3 with Python 3, Locate Press

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