EGE 5003. Geospatial Technology (3 credits)

Unit – 1

Concepts and foundation of remote sensing: energy sources and radiation principles, energy interactions in the atmosphere, energy interaction with earth surface features – Spectral Reflectance - Spectral Response Patterns - data acquisition and interpretation, reference data – elements of photographic system - Introduction to aerial photographs and aerial photo interpretation. Binocular-Mirror-pocket Stereoscopes. Photogrammetric problems.

Introduction to remote sensing- land use-land cover mapping-NDVI. Applications of remote sensing in Geology, Natural resource management, Water resources management; Disaster management and Environmental management.

Unit – 2

Photogrammetry: basic principles – geometric characteristics of aerial photographs - visual image interpretation – stereoscopes –photogrammetric workstations – landform identification and evaluation. Applications of photogrammetry in Geology, Natural resource management, and Urban planning and management.

Geodesy: Ellipsoid – Geoid. Datums – datum shift, datum transformation. Geographic coordinates. Cartesian coordinates. Coordinate conversions. Map projections. Global Positioning System: Basic features, GNSS, NAVSTAR GPS, GLONASS, IRNASS.

Unit – 3

Fundamentals of Geographic Information System – data input, data management, data manipulation, data output. Data Input and Editing: Coordinate Conversion. Digitizing, data encoding, re-projection and transformation. Vector and Raster data analysis. Interpolation and overlay techniques. Preparation and layout of maps. Query analysis. Familiarization of different GIS environments including proprietary and open source such as ArcGIS, QGIS and GRASS. Introduction to Web GIS –Definition- concept-components. Applications of GIS in Geology, Natural resource management, mapping, Urban planning, Water resources management; Disaster management; Environmental management and public health.

References

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- Lillesand, T.M., Kiefer,R.W. and Chipman, J.W. (2004), Remote sensing and image interpretation, Fifth Edition, Wiley, NJ, 812p.
- Mather, P.M. and Koch, M. (2011),Computer Processing of Remotely-Sensed Images – An Introduction, Fourth Edition, John Wiley, New York, 462p.
- McCoy, R. M. (2005), Field methods in remote sensing, Guilford Press, New York, 177p.
- DeMers, M. N. (2009), GIS for dummies, Wiley, NJ, 388p.
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