MANGALORE UNIVERSITY
DEPARTMENT OF MARINE GEOLOGY
MSc GEOINFORMATICS

GIH 452: GEOGRAPHICAL INFORMATION SYSTEM

Course Outcome:

CO1: **Basics of Geographic Information System**: Definition, components, packages, capabilities and purpose of GIS. History of Geographic Information System, Development of GIS as an information and decision making system, Application of GIS in India

CO2: GIS Data and Analysis: Spatial Analysis, Classification, Overlay, Polygon Neighborhoods, Data analyzing operations in GIS, Buffering and neighboring functions , integrated data, raster and vector overly method, problems of vector and raster overlay, spatial interpolation, GIS for surface analysis and network analysis.

Jobs in many Govt. agencies like ISRO, IIRS, NRSA, WIPRO and lot of private companies. They can join for teaching field in degree colleges or engineering colleges

Unit 1	**Basics of Geographic Information System**: Definition, components, packages, capabilities and purpose of GIS. History of Geographic Information System, Development of GIS as an information and decision making system, Application of GIS in India.	06 hrs
Unit 2	Definition- Maps and spatial information, Components of GIS, maps and spatial data- Thematic characteristics of spatial data, other sources of spatial data- sensors, survey data, air photos, satellite images and field data.	06 hrs
Unit 3	Spatial and attribute data, spatial entities, raster and vector spatial data structure, comparison of raster and vector methods, linking spatial and attribute data.	06 hrs

Unit 4	Digitization, Editing and Structuring of Map Data: Mode of digitization, editing, topology creation and structuring map data. Data Quality and Sources of Errors: Nature of geographic data, sources of errors in GIS database, data quality parameters, handling errors in GIS.	06 hrs
Unit 5	**GIS Data and Analysis:** Spatial Analysis, Classification, Overlay, Polygon Neighborhoods, Data analyzing operations in GIS, Buffering and neighboring functions , integrated data, raster and vector overly method, problems of vector and raster overlay, spatial interpolation, GIS for surface analysis and network analysis.	06 hrs
Unit 6	**Concepts of 3D models:** Digital Elevation and Terrain Models (DEM & DTM), Generation and structure of DEM/DTM and their applications. Geospatial Triangulated Irregular Network (TIN) model, slope, aspect, hillshade.	06 hrs
Unit 7	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.	06 hrs
Unit 8	**GIS Modeling:** Cartographic models, Inductive and Deductive Models, Model Flow Charting, Model Implementation and Verification. Principles of Design and GIS Output, GIS Project design and Management.	06 hrs

References

1. Bonham – Carter G.F., Geographic Information System for Geoscientists, Pergamon Press, Tarrytown, New York, 1994.

2. Burough, P.A., and Rachael A, Mec Donnell. Principles of Geographic Information System., Oxford Unversity Press-19908 (Indian Print).

3. Demers, Michael; Fundamental of Geographic Information System, John Wiley, 1999 (Indian Print)

4. Fraser Taylor., P.A., Geographic Information System – The Microcomputer and Modern Cartography, Pergamon Press, 1991.

5. Heywood, Carnelin and Carven,   An Introduction to Geographic Information System by, Prentice Hall, 1998.

6. Keaies, J.S. Cartographic design and Production London, Longman group, 1973.

7. Les Worell, (Ed) 1990.   Geographic Information System, Development and Applications, Belbaven Press.

8. Longley, P. A., Maguire, D. J., Goodchild, M. F and Rhind, D. W; GIS Principles Techniques ,Applications and Managements, Longman Scientific and Technical, 2001 (very Expensive Book).

9. Maguire, D. J. Goodchild, M. F., and Rhind, D. W. GIS- Principles and application, Longman Scientific and Technical, 1991.