THIRD SEMESTER

GIH 501: RS AND GIS IN MARINE RESOURCES AND COASTAL ZONE MANAGEMENT

Skills, employability and entrepreneurship: Remote sensing and GIS play a crucial role in the evaluation of marine resources and coastal zone management. Students learn about modeling and mapping coastal vulnerability to understand the natural and anthropogenic impacts by using spatial planning techniques to attain sustainable development. Students who study in this course have opportunities to work in government organizations like NIO, NCPOR, INCOIS, GSI etc., and several private companies and research institutes. Students can start their own entrepreneurship.

Unit 1	**Introduction and Classification** to Coastal and Marine Environments Historical Review of Oceanography: HMS Challenger Expedition. Fundamentals of Marine ecology, Bio Resource, coastal bathymetry, properties of seawater.	6 hrs
Unit 2	**Ocean Floor Topography:** Continental margins – Active and Passive, Ocean basin floor, Mid oceanic ridge, Submarine Canyons, Waves, Ekman Spiral, Ekman Transport, Upwelling/Down welling Processes.	6 hrs
Unit 3	**Coastal Environment:** Concepts of Zonation, Rocky Shores, Sandy Shores, Cuspate Beaches, Spits and Beach Ridges, Back Shore Dune Environments.	6 hrs
Unit 4	**Marine Environment:** Mangrove Environments, Island Environments, Tidal Flat Environments, Intertidal Environments, Estuarine Environments.	6 hrs
Unit 5	**Major Currents of the Oceans**: Surface currents, Deep ocean currents, Subtropical gyres. Currents in Indian Ocean – Periodical currents (Summer (SW) and Winter (NE) monsoon currents).	6 hrs
Unit 6	**Remote Sensing and GIS:** Applications in Oceanography and Environmental studies. Data products and their acquisition. Satellites and their payloads useful for ocean related studies. **Satellite Oceanography:** History of Oceanographic Satellites. Satellites and their payloads for the retrieval of various coastal parameters. Technical Characteristics of MODIS-Aqua, Oceansat I & II - OCM/MSMR payloads.	6 hrs
Unit 7	**Retrieval of Oceanic Parameters:** Chlorophyll-a, Dissolved organic substances and Total Suspended Matter. Insitu recovery of Chlorophyll, SST, Wind Speed, Sea Surface Currents, Salinity, and TSM. Instruments used for collecting and analysis of the samples. Concepts of Biophysical Coupling. Prediction models of Sea Surface Temperature.	6 hrs
Unit 8	**Applied Oceanography**: Satellite Oceanography and Satellite data products required to generate Potential Fishing Zones. Use of GIS and Cartography to Map Morpho-eco systems of the Coast. Use of Cartography, GIS and Satellite Oceanography in site selection of Major and Minor Ports and Beach Recreational Environments.	6 hrs

BIBLIOGRAPHY

1. Andy Mitchell. The ESRI Guide to GIS Analysis, Vol. 1. ESRI Press, 11-21.
2. Balasubramanian, A. Ecology Environment & Pollution, Indira Publishers, Mysore.11-17.
3. Castro, P., and Huber, M. H., 1997. Marine Biology, McGraw-Hill. 19-80.
4. Das, P.K. The Monsoons, Natl. Book Trust. 9-21.
5. Howard, A. D. and Irwin Remson, Engineering Geology in Environmental Planning. McGraw-Hill publ. 33-42.