AMITY UNIVERSITY
UTTAR PRADESH

COURSE CURRICULUM

Course Title: GIS & Remote Sensing in Marine Science
Course Code: 3
Credit Units:

L	T	P/ S	SW/F W	TOTAL CREDIT UNITS
2	1		-	3

Course Objectives: To teach the students about various techniques of remote sensing and GIS to monitoring of marine resources.

Pre-requisites: Student should have basic of biological science and remote sensing

Student Learning Outcomes:

- Identify the major features of coastal area, tsunami and human activities with the help of satellite images.
- Use Remote Sensing and GIS techniques for marine resource mapping and monitoring
- Know and use main methods to improve, correct and interpret properly Remote Sensing Images. Describe factors responsible for the main land cover behavior

Course Contents/Syllabus:

	Weightage (%)
Module I	**20**
Descriptors/Topics • Coastal and littoral zones – definitions and scope of study • Shore zone processes – waves, tides and currents • Coastal landforms; • River deltas: types of deltas and dynamics of the delta-fringe coasts • Coastal classification	

Module II	**20**
Descriptors/Topics • Coastal wetlands – Mangrove swamps, marshes, lagoons, tidal channels/creeks and their significance in coastal stability and economic importance • Continental margins – forms and processes; territorial waters and Exclusive Economic Zone • Sea level changes – factors involved; effects of sea level oscillations on coastal zones	
Module III	**20**
Descriptors/Topics • Coastal Hazards: • Storm surges and Tsunamis • Origin, propagation and run-up of tsunamis; • Tsunami impact – role of coastal topography and vegetation; • Global warming and Sea-level rise - impact on coastal zones; coastal vulnerability assessment • Coastal hazard preparedness – coastal protection, education and awareness of coastal communities	
Module IV	**20**
Descriptors/Topics • Human activity and coastal environment – deforestation, agriculture/aquaculture, pollution and coastal structures, and their effect on coastal zones, Coastal vegetation; shelter belts; coastal aquifers; freshwater-seawater interface, Morphology of Indian coasts	
Module V	**20**
Descriptors/Topics • Coastal zone management – concepts, models and information systems • Application of remote sensing in coastal zone studies • Role of Geographic Information Systems in coastal zone studies	

Pedagogy for Course Delivery:

The course is designed to be taught through the lecture mode and laboratory exercises. However seminar presentations on various themes related to the course and discussion on various case studies. Class room interaction will definitely have to be an integral part of the learning experience.

Lab/ Practicals details, if applicable:

List of Experiments:

- Satellite image interpretation for identification and delineation of coastal landforms
- Digital Image processing techniques in the mapping of coastal landforms
- Coastal ecosystem mapping and monitoring using satellite image
- CRZ Mapping
- Coastal Disaster mapping and monitoring
- Ocean state forecasting
- Integrated fisheries forecasting and productivity studies
- Processing of sea surface temperature retrieval
- Productivity estimation
- Processing of active microwave data

Assessment/ Examination Scheme:

Theory L/T (%)	**Lab/Practical/Studio (%)**	**End Term Examination**

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					**End Term Examination**
Components (Drop down)	**Class Test**	**Assignment**	**Presentation**	**Attendance**	**EE**
Weightage (%)	10	10	05	05	70

Lab/ Practical/ Studio Assessment:

	Continuous Assessment/Internal Assessment	**End Term Examination**

Components (Drop down	Class Test (Practical Based)	Mid Term Viva	Attendance	Major Lab Exercises	Minor	Practical Record	Viva
Weightage (%)	15	10	05	35	15	10	10

Text & References:

- Geomorphology, Bloom, A.L., Prentice-Hall, 1978
- Deltas, Coleman, J.M., Continuing education Publication Co.Inc. 1976
- Coastal Sedimentary Environments, Davis, A.R. (Jr.), Springer-Verlag, 1985.
- Beaches and Coasts, King, C.A.M., Edward Arnold, 1972
- Introduction to Marine Geology and Geomorphology, King, C.A.M., Edward Arnold, 1974
- Applications in Coastal Zone Research Management, Martin, K.St. (ed), U.N. Institute for Training and Research, 1993.
- Integrated Ocean and Coastal Management, Sain, B.C., and Knecht, R.W.,UNESCO Publication, 1998.
- Subtle Issues in Coastal Management, Sudarshan et al., (ed), IIRS, Dehra Dun, 2000.
- Tsunamis – case studies and recent developments, Satake, K. (ed), Springer, 2005

Research Journals

- Environmental Earth Science
- Hydrogeology Journal
- Hydrological Science Journal
- Journal of Earth System Science
- Current Science