



AMITY UNIVERSITY

— UTTAR PRADESH —

COURSE CURRICULUM

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

Course Title: GIS & Remote Sensing in Disaster Management

Course Code:

Credit Units: 3

Course Level: PG

Course Objectives: The course objective is to explore the utility of earth observation satellites for assessment, mapping and monitoring various types of natural and manmade disasters and their management.

Pre-requisites: Student should have the basic of geological science and remote sensing.

Student Learning Outcomes: • Applications of remote sensing and GIS in geological, hydro meteorological and environmental hazards. Handle the different types of satellite data and software for mapping and analysis of flood, forest fire, landslide and drought prone area

Course Contents/Syllabus:

	Weightage (%)
Module I Introduction	20
Descriptors/Topics Definition, classification and types of Disaster, Fundamental concepts of hazards and disasters, their types, and	

<p>characterization, zonation of hazards, natural and human induced disasters. Disaster and National losses, historical perspective of disasters in India.</p> <p>Application and importance of Remote sensing and geospatial techniques in Disaster Management- Reconnaissance, forecast, forewarning systems, Disaster preparedness with respect to different disasters.</p>	
<p>Module II Earth Quake and Landslide</p>	<p>20</p>
<p>Descriptors/Topics</p> <p>Introduction, Causes and type of earthquake, Remote Sensing in earthquake prediction and mitigation, seismic damage evaluation and loss estimation, RS and GIS application for post quake rehabilitation, GIS database for previous earthquakes, space technology and earthquake prediction, geospatial information system for earthquake disaster management.</p> <p>Introduction, types and causes of Landslides. Landslide mitigation and assessment measures, land slide zonation, land slide susceptibility mapping, land slide monitoring, and landslide analysis using advance geospatial techniques.</p>	
<p>Module III Drought and Flooding</p>	<p>20</p>
<p>Introduction, type and causes of drought. Delineation of drought vulnerable areas using RS and GIS; Drought Information System; Drought monitoring; GIS based drought analysis; Desertification factors, Assessment of drought impact using RS and GIS. Monitoring vegetative biomass, Drought management- prediction, preparedness, monitoring of drought. Floods types-flash and riverine floods, snowmelt floods, causes and mitigation measures, flooding potential zonation mapping and flood risk analysis using RS and GIS.</p>	
<p>Module IV Natural and Man Made Disaster</p>	<p>20</p>
<p>Deforestation, Forest fires its cause and role of remote sensing techniques in assessment and monitoring environmental hazards. Land, soil degradation, desertification and Pollution (Water, air and soil). Soil Erosion its types, causes,</p>	

and mitigation measures, application of RS and GIS for soil erosion and desertification studies, role of remote sensing in estimation of soil erosion, soil erosion mapping universal soil loss equation and GIS, land degradation studies, sodic soil mapping using satellite images.	
Module V Disaster Management and Role of earth observation satellites	20
Fundamental concept of Disaster Management, government, NGOs and peoples participation disaster management. Existing organization structure for managing disasters in India. Geoinformatics in disaster mitigation. Mapping disaster vulnerable zones, fire hazard sand storm water inundations, earthquake impact assessment. Disaster management plan preparation using remote sensing. Case studies based on remote sensing for disaster management.	

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:

- Flood prone area mapping using satellite images and ancillary data.
- Forest fire risk mapping using satellite images and GIS.
- Landslide mapping and risk evaluation.
- Multivariate analysis and application of GIS model for landslide hazard zonation
- Drought prone area mapping using satellite images
- Spatial variation of climatic data using GIS techniques for drought prediction.
- Multiple hazard mapping using satellite images and modeling risk in GIS.
- Land degradation analysis using remote sensing and GIS.

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:

- P.S. Roy, (2000). Natural Disaster and their mitigation. Published by Indian Institute of Remote Sensing (IIRS).
- Spatial Technologies for Natural Hazard Management. Proceedings of ISRS National Symposium, Nov. 21-22, 2000, IIT, Kharagpur.

Research Journals

- Journal of Earth System Science
- Current Science
- Environmental Earth Science
- Applied Earth Observation and Geoinformation