



COURSE CURRICULUM

Course Title: GIS & Remote Sensing in Agriculture & Forestry

Course Code: 4

Credit Units:

Course Level : PG

L	T	P/ S	SW/F W	TOTAL CREDIT UNITS
2	1	1	-	4

Course Objectives: To teach the students about the fundamentals agriculture and forestry and application of remote sensing and GIS to agriculture and forestry resource mapping and monitoring.

Pre-requisites: Student should have basics of plant science and remote sensing.

Student Learning Outcomes:

- Understand main concepts that define agriculture and forestry and use Remote Sensing and Geographic Information Systems for their management.
- Use Remote Sensing and GIS techniques for mapping of various thematic maps for soil mapping, crop estimation, vegetation mapping and forest change detection.

Course Contents/Syllabus:

	Weightage (%)
Module I	20
Descriptors/Topics Remote Sensing in Agriculture – An Overview, Spectral characteristics of crops, Principles of crop identification and Crop acreage estimation, Crop yield modelling using Remote Sensing, Crop condition and stress assessment using RS techniques, RS and GIS applications in Crop inventory, Agro-meteorology – its importance and application of RS in agro-meteorology, Drought assessment and monitoring through Remote Sensing	
Module II	20
Descriptors/Topics Forest: Introduction and distribution of forests, Forest types of India, Forestry:Introduction and concept of forestry,Role	

of RS and GIS in forestry, Interaction of EMR with vegetation and spectral characteristics of vegetation, Temporal characteristics of Vegetation, Vegetation indices, Forest cover mapping through RS and GIS	
Module III	20
Descriptors/Topics Forest types and forest density mapping, Remote Sensing application in forest cover change detection, Remote Sensing application in mapping of stressed vegetation, Study of association between rock and forest types using RS and GIS.	
Module IV	20
Descriptors/Topics Role of Microwave Remote Sensing in forest studies, Biomass estimation by non destructive method, Growing stock estimation using RS and GIS, Remote Sensing application in formulation of forest working plan	
Module V	20
Descriptors/Topics Bio diversity studies using RS and GIS, Wildlife habitat analysis using RS and GIS, Biological invasion and monitoring of invasive species through RS and GIS, Forest Management Information System (FMIS)	

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:

- Land use / land cover mapping
- Identification of degraded lands
- Land utilization mapping
- Soil mapping
- Crop estimation studies
- Identification of forest species from aerial photographs
- Vegetation mapping from satellite images
- Digital image enhancements for vegetation/forest
- NDVI analysis
- Digital classification for forest cover mapping

- Forest change detection studies

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:

- Anji Reddy, M. 2004 : Geoinformatics for environmental management. B.S. Publications
- Franklin S.E. 2001. Remote Sensing for sustainable forest management. Lewis Publication
- Gupta, R.P., 1990: Remote Sensing Geology. Springer Verlag.
- Jensen, J.R. 2000 : Remote Sensing of the Environment: An Earth resource Perspective. Prentice Hall
- Lillesand, T.M., and Kieffer, R.M., 1987: Remote Sensing and Image Interpretation, John Wiley.

Research Journals

- International Journal of Geoinformatics
- International Journal of Remote Sensing
- Environmental Earth Science
- Remote Sensing of Environment