Course title: Advances in Remote Sensing

Course code: NRG 177	**No. of credits:** 4	**L-T-P:** 28-14-28	**Learning hours:** 56

Pre-requisite course code and title (if any): NRG 172 Digital image processing and information extraction

Department: Department of Natural Resources

Course coordinator: Dr Nithiyanandam Yogeshwaran	**Course instructor:** Dr Nithiyanandam Yogeshwaran

Contact details:

Course type: Core	**Course offered in:** Semester 3

Course Description

The course will provide opportunity to understand and work with latest developments in the Remote Sensing datasets. The curriculum covers wide range of remote sensing data interpretation and their processing techniques.

Course objectives

1. To build up a high level of practical skills and experience in the use of RS and GIS tools.
2. To provide environment to address global and regional environmental problems

Course content

SNo	Topic	L	T	P
1.	Advance Classification (Decision Tree, SVM, ANN, Object oriented)	6		8
2.	Hyperspectral Remote Sensing (interpretation, processing and classification)	6	4	8
3.	Microwave Remote Sensing (SAR, SLAR, Radar, INSAR, SRTM and interpretations & applications)	8	6	8
4.	Thermal Remote Sensing (Interpretation and Applications)	6	2	2
5.	LiDAR (introduction and applications)	2	2	2
	Total	**28**	**14**	**28**

Evaluation criteria

- 2 minor tests: 10% each
- Tutorials: 20%
- Practical: 20%
- Major exam: 40%

Learning outcomes

1. Latest developments in the Remote Sensing datasets

Pedagogical approach

Materials

Required text

1. Cracknell A.P. (ed) ( ) Remote Sensing in Meteorology, Oceanography and Hydrology, Chichester, Ellis Horwood Limited.
2. Ghassem A. ( ) Theory and Applications of Optical Remote Sensing, New York, John Wiley and Sons.
3. Skolnik and Merrill I. ( ) Introduction to Radar Systems, McGraw-Hill (1st ed., 1962; 2nd ed., 1980; 3rd ed., 2001).

Suggested readings

1. *Jensen J.R. (2000) Remote Sensing of the Environment: An Earth Resource Perspective, Prentice Hall.*
2. John R.J. (2000). *Introductory Digital Image Processing: Remote Sensing Perspective*, New Jerysey, Prentice Hall.
3. *Lillesand T.M., Kiefer R.W. and Chipman J.W. (2003) Remote Sensing and Image Interpretation, 5th ed., Wiley.*
4. Moffitt F. H. (1980) Photogrammetry, 3rd Ed, Harper & Row, New York.
5. Smith R.B. (2006) Introduction to Hyperspectral Imaging with TMIPS, Micro Images Tutorial Web site.
6. Steven M.D. and Clark J.A. Applications of Remote Sensing in Agriculture London Butterworths.
7. Wolf P.R. (1983) Elements of Photgrammetry, McGraw-Hill, New York.
8. Zorn H.C. (1980) Introductory Course in Photogrammetry, 6th Ed. ITC, Netherlands.

Case studies

Websites

Journals

1. Advances in Water Resources
2. Agricultural and Forest Meteorology
3. Asian Journal of Geoinformatics
4. Ecological Modelling
5. Geocarto International
6. International Journal of Geoinformatics
7. International Journal of Remote Sensing
8. ISPRS Journal of Photogrammetry and Remote Sensing
9. Journal of Indian Society of Remote Sensing
10. Remote Sensing of Environment

Additional information (if any)

Magazines

1. Coordinates
2. GIM International
3. GIS World
4. GIS@development
5. Goespatial today
6. GPS World

Student responsibilities

Attendance, feedback, discipline, guest faculty etc