Geoinformatics in Forest Resource Management

Division of Natural Resource Management

Faculty of Forestry

Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir

Course Overview and Introduction

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Course code	:	**FRM 604**
Course Title	:	**Geoinformatics in Forest Resource Management**
Number of credits	:	**4**
Course duration	:	**18 weeks**
Level	:	**Doctoral**
Link to the course	:	https://www.youtube.com/playlist?list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m

Course Syllabi and Outline

	UNIT 1
Week1	Brief introduction to Remote sensing and GIS, Data structure, type and model: Raster and Vector data structure, vector data type, point, line and polygon
Week2	Data hierarchical models and overlays.
Week3	Practical: Preparation maps; Visual interpretation of satellite imagery; Forest cover mapping and land use mapping.
Week4	Spatial analysis of vector based and raster based data in the software..
Week5	Digital elevation models, Global positioning system and differential GPS
Week6	Practical: Spectral characteristics of vegetation, water and soil; Study of Topo-sheets, Forest watershed delineation using GPS
Week7	Mid Term Exam
	UNIT 2
Week8	Optical, thermal and microwave remote sensing, LiDAR remote sensing
Week9	Practical: Satellite remote sensing; Study of satellite imageries; Digital image interpretation, Digital image processing in ERDAS software, image classification in ERDAS, preparation of thematic maps in Arc GIS
Week10	Satellite image interpretation and recognition elements: tone, color, texture, pattern, shape, size and associated features.
Week11	Introduction of ERDAS, Arc GIS and PolSar-Pro, ENVI softwares
Week12	Digital image processing, image rectification, geometric corrections, Image enhancement techniques
Week13	Digital image classification, supervised and unsupervised classification.
Week14	Vegetation Indices, Vegetation Index (VI), Normalized Differential Vegetation Index (NDVI), Soil Adjusted Vegetation Index (SAVI) etc.
Week15	Practical: Watershed delineation and clipping using ERDAS and Arc GIS. Mapping of forest with PolSarPro software, Biomass estimation using RS techniques.
	UNIT 3
Week16	Applications of Multispectral, Hyperspectral, thermal and microwave remote sensing.
Week17	Case studies on application of remote sensing and GIS in natural resource management.
Week18	Practical Exam/Assignment submission/Presentation
	End Tem Exam

E-Links to the course (Video/Textbook)

Topic	Link to the E-Course
Digital Image Formats	https://www.youtube.com/watch?v=E2xh8BT5Ur8&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=1
Digital Image Processing Part-1	https://www.youtube.com/watch?v=j0eqEZ4gpG0&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=2
Digital Image Processing Part-2	https://www.youtube.com/watch?v=5FdNXsyUP0s&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=3
Accuracy Assessment in Mapping	https://www.youtube.com/watch?v=7dX17bp8tlQ&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=4&t=8s
False Color Composite & True Color Composite	https://www.youtube.com/watch?v=bcMZHwH9pCU&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=5
Multiband Operations	https://www.youtube.com/watch?v=42QvKNRx2cY&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=7
Aerial Photography	https://www.youtube.com/watch?v=4eelhdVFTQo&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=8
Introduction to Photogrammetry	https://www.youtube.com/watch?v=PTnL7ZI7yJs&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=9&t=68s
Scale, Focal Length and Height	https://www.youtube.com/watch?v=f1-kzkcpf9U&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=10&t=19s
Relief Displacement Formula	https://www.youtube.com/watch?v=HDg6oZuq52Y&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=11&t=17s
Database Management System (DBMS)	https://www.youtube.com/watch?v=6yEkm_UI7PA&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=12
Topology, Thematic and Raster Overlay	https://www.youtube.com/watch?v=WhAQpkAV8tM&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=13
Map Projection and Types	https://www.youtube.com/watch?v=tlDiHeHsLns&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=14
Microwave Remote Sensing	https://www.youtube.com/watch?v=dCt1BYLlm5k&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=15&t=101s
Raster data storage and compression	https://www.youtube.com/watch?v=2XvrOQmNnaI&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=16&t=10s
Global Positioning System	https://www.youtube.com/watch?v=_m0FZcZGKdk&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=18&t=30s
How GPS works?	https://www.youtube.com/watch?v=9ees6hLatrE&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=17&t=515s

Course Objectives

The course prepares students for careers as leaders in understanding Remote Sensing (RS) and Geographical Information System (GIS) and Applications of RS and GIS in monitoring and managing forest resources.
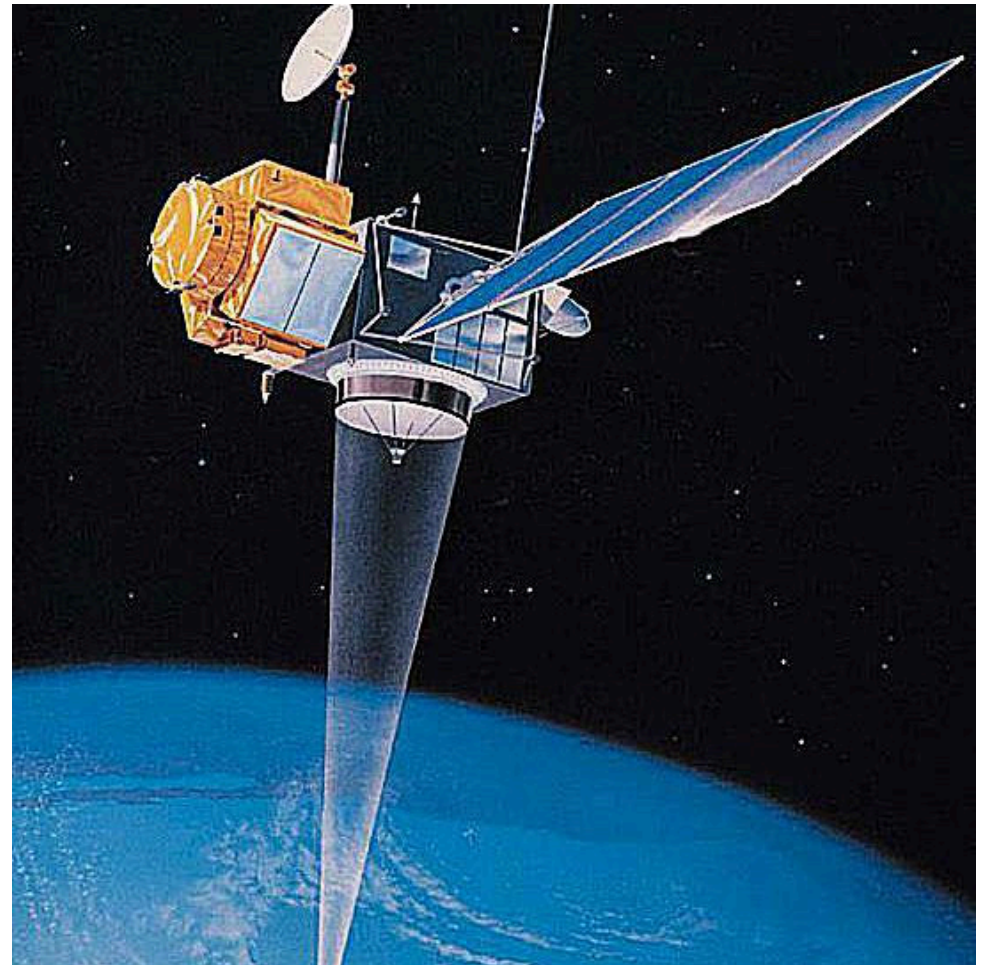
Learning Outcomes

- Wider understanding of basic principles of remote sensing and GIS
- Exploring and handling different satellite datasets for specific applications in forests and vegetation landscapes.
- Enhancing abilities and skills for mapping and monitoring of changes associated with forest and urban green spaces for effective policy making and management.