Geomatics
NRM 3212

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Division of Natural Resource Management
Faculty of Forestry
Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir

Course Overview and Introduction

Course code	:	**NRM 3212**
Course Title	:	**Geomatics**
Number of credits	:	**4**
Course duration	:	**18 weeks**
Level	:	**Undergraduate**
Link to the course	:	https://www.skuastkashmir.ac.in/DisplaySInformation.aspx?id=12&pid=103345

Course Syllabi and Outline

	UNIT 1
Week1	Remote sensing - classification based on source: Active and passive remote sensing
	Aerial and space remote sensing; Interaction of electromagnetic radiation with atmosphere and earth surface
Week2	Aerial photographs – types; Photo interpretation
	Practical: Preparation maps; Visual interpretation of satellite imagery; Forest cover mapping and land use mapping.
Week3	Satellite remote sensing - platforms and sensors
	Satellite systems. Indian Remote Sensing Programme
Week4	Visual and digital image processing;
Week5	Practical: Digital image processing. Introduction to various GIS software – Q-GIS, ERDAS, Arc GIS etc.
	Mid Term Exam
	UNIT 2
Week6	Application of satellite based remote sensing techniques in forestry
	vegetation mapping using satellite imagery-NDVI
Week7	Practical: Hand on exercises on Vegetation Indices, Vegetation Index (VI), Normalized Differential Vegetation Index (NDVI), Soil Adjusted Vegetation Index (SAVI) etc
Week8	Forest cover monitoring and damage assessment
	Microwave remote sensing

	UNIT 3
Week9	Introduction to GIS.
	Differences between GIS and conventional cartography
Week10	Spatial and non-spatial data- Integration of attribute data with spatial data
	Spatial data - Raster and Vector data-Thematic over lays in GIS
Week11	Topology building and calculation of area and length etc
Week12	Practical: Exercises in viewing, editing, overlay.
	UNIT 4
Week13	Application of GIS in forestry – using imageries and integration with GIS data
	Maps-its projection
Week14	Toposheet and Map reading.
	Visit to the GIS labs at State level.
Week15	**UNIT 5**
	Global Positioning System (GPS)
Week16	Applications in resource inventory
	Global Navigation Satellite System
Week17	Galileo, GLONASS, QZSS, Compass, IRNSS etc., GAGAN
	Practical: GPS handling
Week18	Practical Exam/Assignment submission/Presentation
	End Tem Exam

E-Links to the course (Video/Textbook)

Topic	Link to the E-course
Introduction to Remote Sensing Part-1	https://www.youtube.com/watch?v=TEPdVkWAABc&list=PLgQLxnNI9f_C8QXAlhXprtN47eBYT3lq6&index=1&t=6s
Introduction to Remote Sensing Part-2	https://www.youtube.com/watch?v=-inU7S2n5sg&list=PLgQLxnNI9f_C8QXAlhXprtN47eBYT3lq6&index=2&t=277s
Introduction to Remote Sensing Part-3	https://www.youtube.com/watch?v=QamG5FhnmgY&list=PLgQLxnNI9f_C8QXAlhXprtN47eBYT3lq6&index=3&t=125s
Satellite Systems	https://www.youtube.com/watch?v=avLN5Xjproo&list=PLgQLxnNI9f_C8QXAlhXprtN47eBYT3lq6&index=4
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
Interaction of EMR with atmosphere	https://www.youtube.com/watch?v=IspXDE2by_Q&list=PLgQLxnNI9f_C8QXAlhXprtN47eBYT3lq6&index=7&t=120s
Digital Image Resolution	https://www.youtube.com/watch?v=n3nwbNh1OYM&list=PLgQLxnNI9f_C8QXAlhXprtN47eBYT3lq6&index=8
Types of Resolution	https://www.youtube.com/watch?v=1UxtQNSt970&list=PLgQLxnNI9f_C8QXAlhXprtN47eBYT3lq6&index=9
Introduction to Photogrpammetry	https://www.youtube.com/watch?v=PTnL7ZI7yJs&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=9&t=68s
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

Introduction to GIS	**https://www.youtube.com/watch?v=1lT9NnYsL-Q&list=PLgQLxnNI9f_C8QXAlhXprtN47eBYT3lq6&index=13**
GIS models and data representation	https://www.youtube.com/watch?v=E0HQAnoY2Eg&list=PLgQLxnNI9f_C8QXAlhXprtN47eBYT3lq6&index=14
Introduction to GIS database management system	https://www.youtube.com/watch?v=vO_J7jVhoVc&list=PLgQLxnNI9f_C8QXAlhXprtN47eBYT3lq6&index=15&t=21s
Aerial Photography	https://www.youtube.com/watch?v=4eelhdVFTQo&list=PLgQLxnNI9f_D7c1JYC8OiF3rFxkoEhj2m&index=8
Introduction to Photogrpammetry	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
Visual Image Interpretation	https://www.youtube.com/watch?v=dclDduYUMI8&list=PLgQLxnNI9f_C8QXAlhXprtN47eBYT3lq6&index=22
Map Projection and Types	https://www.youtube.com/watch?v=tIDiHeHsLns&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 main course objective is to make students understand the basics of remote sensing and Geographical Information System and Global Positioning System (GPS). It is further aimed at developing among students the skills to use remote sensing and GIS based software. The course is outlined and offered in hybrid mode to enable students learn and pick up at their own pace and have the flexibility in their schedule.

Learning Outcomes

- Wider understanding of basic principles of remote sensing and GIS
- Explore 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.


Thank You!