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INSTITUTE OF ENGINEERING & TECHNOLOGY

A
WORKSHOP
REPORT
ON
“BASICS OF REMOTE SENSING, GEOGRAPHICAL INFORMATION
SYSTEM & GLOBAL NAVIGATION SATELLITE SYSTEM”



DEPARTMENT OF CIVIL ENGINEERING PIET

Mr. Saurabh Singh
(Faculty Coordinator)

Dr. P. N. Dadhich
(HOD Department of Civil)



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Introduction:

The Department of Civil Engineering organized workshop on Basics of Remote Sensing, Geographical Information System & Global Navigation Satellite System with IIRS Outreach Programme.

The use of Remote Sensing, Geographical Information System, Global Navigation Satellite System and associated geospatial technologies is increasing rapidly, creating an urgent demand for trained manpower. IIRS utilizes the Ku-Band facility of INSAT-4CR, an ISRO Satellite and Internet, for conducting Distance Learning Programme to primarily complement the educational programmes of the Indian Universities. IIRS has established its own Teaching end studio and up linking facility in the campus under national beam coverage of ISRO satellites, connecting numerous classroom end users. Internet bandwidth is also used as an alternative option.

Contents:

The course is divided into 4 modules:

- Remote Sensing and Digital Image Analysis
- Global Navigation Satellite System
- Geographical Information System
- RS and GIS Applications

About the Workshop:

The Department of civil Engineering conducts a four days workshop on “**Basics of Remote Sensing, Geographical Information System & Global Navigation Satellite System with IIRS Outreach Programme**”. The four days workshop conducted on 22th to 25th august 2016. The four days workshop divided in four module given as below.

These modules include:

- Basic Principles of Remote Sensing, Earth Observation Sensors and Platforms, Spectral Signature of different land cover features, Image interpretation
- Thermal & Microwave Remote Sensing



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- Digital Image Processing: Basic Concepts of Rectification and Registration, Enhancement, Classification and accuracy assessment techniques

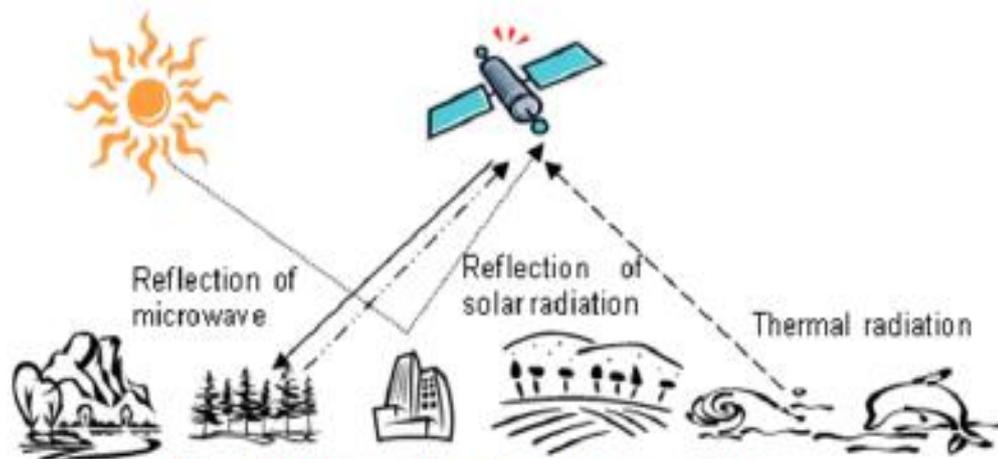


Figure1-1 Conceptual outline of remote sensing

- Introduction to GPS and GNSS, receivers, processing methods, errors and accuracy
- GIS, data bases, topology, spatial analysis and open source software's.
- RS & GIS Applications: Agriculture and Soil, Forestry and Ecology, Geoscience and Geo hazards, Marine and Atmospheric Sciences, Urban and Regional Studies and Water Resource

Participants: In this workshop the total 34 students are participate.

Venue: BB-34

Resource Person: Dr. Ankita Dadhich (Professor, MNIT Jaipur)



Execution Module:

The workshop is executed in following manner with 34 students from 3rd & 4th year.

Module	Name of the Module	From
1	Remote Sensing and Digital Image Analysis	22-08-2016
2	Global Navigation Satellite System	23-08-2016
3	Geographical Information System	24-08-2016
4	RS & GIS Applications	25-08-2016

Outcome of Workshop:

One of the most basic types of information used in field work is space information about a specific target area. There are various types of information which that fall within space information; such as information concerning topography, land use, social infrastructure, climate,

and manufacturing infrastructure. All of this information must be appropriately gathered, in accordance with the objectives of a study or research. Remote sensing and geographic information systems (GIS) are among the many useful means for gathering and analyzing such information. Using aerial photography and satellite image obtained through remote sensing, it is possible to gather information covering wide geographic areas; such as information about natural resources or information about the environment. Registered students are awaked about basic knowledge of:

- Remote Sensing and Digital Image Analysis
- Global Navigation Satellite System
- Geographical Information System
- RS and GIS Applications



Pic. Presentation by faculty



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Quiz

Q.No.	Question	Option-A	Option-B	Option-C	Option-D
1	DIP refers to	Data Integration Process	Digital Image Processing	Digital Image Programme	none of these
2	Which of the following is <i>not</i> a type of radiometric correction used in image processing when there is interference with the radiance measured by an instrument?	Haze correction	Sun angle correction	Noise removal	Ozone depletion correction
3	In the process of image classification, which of the following methods results in a greater <i>accuracy</i> of classes within an image actually matching land use patterns on the ground?	Robotic classification	Manual/supervised by a user	Fully automated	Unprocessed image interpretation
4	Which of the following types of sensors uses a highly focused beam of light?	Lidar	Ground penetrating radar	Sonar	Side-looking radar
5	GPS stand for	Global Potential Satellite	Geographic Positioning System	Geodial Position Satellite	Global Positioning System



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6	How does a Landsat satellite differentiate between objects on Earth's surface?	Landsat uses a single detector to measure the intensities of energy.	Landsat satellites take pictures using visible light	Features on Earth radiate warmth at different frequencies, which show up as different colors on Landsat images	Landsat measures the longest frequencies of electromagnetic radiation from Earth.
7	What is meant by the term 'spatial filtering' in remote sensing?	Changing the position of pixels in an image because of inconsistencies in the relationship between sensor and surface during data collection	Separating a scene into separate constituent parts and focusing on a smaller section to increase the resolution	Making parts of the image at a different scale to another part of the image	Selectively preserving certain pixel frequencies in an image to enhance particular features or edges of objects
8	Which is not type of remote sensing	active remote sensing	passive remote sensing	current remote sensing	all of the above
9	Active remote sensing can be described as	in which artificial energy used	natural energy used	sun light used	all of the above
10	Spatial filters are used for	geometric correction	noise reduction	data smoothing	both b and c
11	Sensor in remote sensing:	detect electromagnetic radiation reflected from earth surface feature	analyze the electromagnetic radiation	interpret the electromagnetic radiation for satellites	none of the above
12	Living vegetation appears _____ on false-color IR images.	white	black	blue	red



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13	Satellite data acquire for remote sensing can be used for :	urban management	forest fire prevention	flood monitoring	all of the above
14	Which of the following statements is <i>not</i> correct?	The degree to which matter in the atmosphere scatters and absorbs energy depends on the wavelength of the energy	More than one type of scattering in the atmosphere can occur	Electromagnetic energy is a wave of particles travelling through space	The way electromagnetic energy interacts with material on the ground surface will always be the same for a particular spectral band
15	What is the electromagnetic spectrum?	Visible light	frequencies measured by satellites	the arrangement of electromagnetic radiation	energy emitted from Earth
16	What is photogrammetry?	Determining the geometric properties of objects from photographic images	Estimating the three-dimensional coordinates of points on an object	Acquisition of objects without contact of large complex scenes in 3D	Analysing a real-world object or environment to collect data on its shape and possibly its appearance
17	Which of the following is not a type of image resolution that is very important in image analysis?	Energy	Temporal	Spatial	Spectral
18	Which of the following statements is true?	An equal area is covered by both vertical and oblique remote sensing imagery	A greater area can be covered in vertical rather than oblique remote sensing imagery	A greater area can be covered in vertical rather than oblique remote sensing imagery	None of the Above



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19	which of the following is <i>not</i> a reason why remote sensing is ideal for use in physical geography?	It can be applied at any scale	It will always be more reliable than fieldwork studies	It can monitor change over time	none of the above
20	Image enhancement techniques include	Band Ratioing	Contrast enhancement	Atmospheric correction	both a and b
21	GPS stand for	Global Potential Satellite	Geographic Positioning System	Geodial Position Satellite	Global Positioning System
22	How does a Landsat satellite differentiate between objects on Earth's surface?	Landsat uses a single detector to measure the intensities of energy.	Landsat satellites take pictures using visible light	Features on Earth radiate warmth at different frequencies, which show up as different colors on Landsat images	Landsat measures the longest frequencies of electromagnetic radiation from Earth.
23	What is the electromagnetic spectrum?	Visibe light	frequencies measured by satellites	the arrangement of electromagnetic radiation	energy emitted from Earth
24	What is remote sensing?	Ability to gather information about a distant or unseen target using paranormal means or extra-sensory perception	Small or large-scale acquisition of information of an object or phenomenon not in physical or intimate contact	Electrical impedance measuring technique that uses separate pairs of current-carrying and voltage-sensing electrodes to make more accurate measurements	Allowing graphical applications to be run remotely on a server, while being displayed locally



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25	What is photogrammetry?	Determining the geometric properties of objects from photographic images	Estimating the three-dimensional coordinates of points on an object	Acquisition of objects without contact of large complex scenes in 3D	Analysing a real-world object or environment to collect data on its shape and possibly its appearance
26	which of the following is <i>not</i> a reason why remote sensing is ideal for use in physical geography?	It can be applied at any scale	It will always be more reliable than fieldwork studies	It can monitor change over time	none of the above
27	Which of the following statements is true?	An equal area is covered by both vertical and oblique remote sensing imagery	A greater area can be covered in vertical rather than oblique remote sensing imagery	A greater area can be covered in vertical rather than oblique remote sensing imagery	None of the Above
28	Which of the following is not a type of image resolution that is very important in image analysis?	Energy	Temporal	Spatial	Spectral
29	Which of the following statements is <i>not</i> correct?	The degree to which matter in the atmosphere scatters and absorbs energy depends on the wavelength of the energy	More than one type of scattering in the atmosphere can occur	Electromagnetic energy is a wave of particles travelling through space	The way electromagnetic energy interacts with material on the ground surface will always be the same for a particular spectral band
30	Which of the following is <i>not</i> a method of energy scattering in the atmosphere	Rayleigh scattering	Amalgamated scattering	Non-selective scattering	Mie scattering



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31	Which of the following types of sensors uses a highly focused beam of light?	Lidar	Ground penetrating radar	Sonar	Side-looking radar
32	Which of the following is <i>not</i> a type of radiometric correction used in image processing when there is interference with the radiance measured by an instrument?	Haze correction	Sun angle correction	Noise removal	Ozone depletion correction
33	What is meant by the term 'spatial filtering' in remote sensing?	Changing the position of pixels in an image because of inconsistencies in the relationship between sensor and surface during data collection	Separating a scene into separate constituent parts and focusing on a smaller section to increase the resolution	Making parts of the image at a different scale to another part of the image	Selectively preserving certain pixel frequencies in an image to enhance particular features or edges of objects
34	In the process of image classification, which of the following methods results in a greater <i>accuracy</i> of classes within an image actually matching land use patterns on the ground?	Robotic classification	Manual/supervised by a user	Fully automated	Unprocessed image interpretation
35	An automated system for the capture, storage, retrieval, analysis, and display of spatial data is	GPS	Landsat	GIS	none of the above



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	known as				
36	Living vegetation appears _____ on false-color IR images.	white	black	blue	red
37	Which is not type of remote sensing	active remote sensing	passive remote sensing	current remote sensing	all of the above
38	Satellite data acquire for remote sensing can be used for :	urban management	forest fire prevention	flood monitoring	all of the above
39	Sensor in remote sensing:	detect electromagnetic radiation reflected from earth surface feature	analyze the electromagnetic radiation	interpret the electromagnetic radiation for satellites	none of the above
40	Active remote sensing can be described as	in which artificial energy used	natural energy used	sun light used	all of the above

Evaluation Sheet

SL No	Registration Number	First Name	Last Name	Marks Scored	Mob No
1	PIET/CIV/13/145	Shubham	khandelwal	48	8854833519
2	PIET/CIV/13/520	Shivi	mehrotra	40	8058807065
3	PIET/CIV/13/074	Ritika	gupta	59.33	8766607283
4	PIET/CIV/13/521	View	dosi	38	9461995408
5	PIET/CIV/13/078	Ronak	godha	46.33	9672224475
6	PIET/CIV/13/518	Rrohit	gupta	42	9351533536
7	PIET/CIV/13/053	Pawan	goyal	34	9828116840
8	PIET/CIV/13/055	Prakhar	hazrati	41	8824066286
9	PIET/CIV/13/073	Ritik	khandelwal	37	9649565807
10	PIET/CIV/13/067	Ramesh chand	sharma	53.25	
11	PIET/CIV/13/083	Satyam	mehta	27	8058642504
12	PIET/CIV/13/076	Rohit	sahu	23	9530064045
13	PIET/CIV/13/001	Adarsh	Kotiyal	38.5	8559948894
14	PIET/CIV/13/021	Govind	Vaishnav	49	
15	PIET/CIV/13/118	Ganpat lal	Godari	41	9414172212



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16	PIET/CIV/13/523	Himanshu	Bansal	43	7792920724
17	PIET/CIV/13/009	Arpit	gupta	53.25	7597165185
18	PIET/CIV/13/128	Kuldeep	sharma	38.83	9214990007
19	PIET/CIV/13/042	Mohit	Jaiman	39.5	8561029589
20	PIET/CIV/13/510	Mohit	Raishinghani	48.5	9351544224
21	PIET/CIV/13/034	Karan	singh	49	9571417736
22	PIET/CIV/13/508	Ishan	goyal	56.5	9460511090
23	PIET/CIV/13/124	Ishu	khanna	ABSENT	9829320896
24	PIET/CIV/13/022	Gyanendra	sharma	53.83	9929271530
25	PIET/CIV/13/005	Akshay	gupta	ABSENT	9460853657
26	PIET/CIV/13/110	Dhruv	Bhatnagar	43.08	7597474110
27	PIET/CIV/13/129	Kunal	Pareek	33	9828023411
28	PIET/CIV/13/115	Bhuvnesh	Goyal	44	9269551648
29	PIET/CIV/13/111	Aditya	Singh Bhali	ABSENT	9929803382
30	PIET/CIV/13/220	Aditya	Singh Shekhawat	38.08	7792831904
31	PIET/CIV/13/010	Ashish kumar	Sain	31.5	8824098230
32	PIET/CIV/13/004	Ajaypal	Singh Deora	ABSENT	7742228362
33	PIET/CIV/13/109	Aakansha	Mittal	53	9414354725
34	PIET/CIV/13/522	Aarzo	Bhasin	54	7877055303