DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

64th IIRS Outreach Programme
on
"Basic of RS, GIS & GNSS"

By Dr. Prakash Chauhan, Ms. Manu Mehta, Mr. Vinay Kumar, Dr. Hina Pande, Ms. Minakshi Kumar, Dr. Poonam S. Tiwari,, Dr. Yogesh Kant, Ms. Supriya sharma, Mr. Vinay Kumar, Mr. Shashi Kumar, Ashish Joshi, Mrs. Shefali Agrawal, Dr. Ashutosh Bhardwaj, Shri Kamal Pandey, Shri Suresh Kannaujiya, Dr. Sameer Saran, Shri Prasun Kumar Gupta, Shri K. Shiva Reddy, Shri Ashutosh Kumar Jha, Shri Prabhakar Alok Verma, Shri Kapil Oberai, Dr. Harish C. Karnatak, Shri Ravi Bhandari, Shri Dharmendra Kumar, Dr. S. K Srivastav, Dr. N.R. Patel, Dr. D. Mitra, Dr. R.S. Chatterjee, Dr. P.K.C.Ray, Shri. Pramod Kumar, Dr. A.K Mishra, Dr. Hitendra Padalia, Dr. Prakash Chauhan, Dr. S.P Aggarwal, Dr. Arijit Roy, Dr. Suresh Kumar, Indian Institute of Remote Sensing, Dehradun

17 August – 20 November, 2020

The Department of Electronics and Communication Engineering has organized a 61-Day Outreach Programme conducted by Indian Institute of Remote Sensing, Dehradun during 17 August – 20 November, 2020. The target audience are the faculty and students of various disciplines of Sree Vidyanikethan Educational Trust, Tirupati.

Planetary exploration has revealed several interesting facts related to the surface features on the planets and their satellites. The workshop on basics of RS, GIS & GNSS is planned to provide an overview of planetary science, introduce students to the Remote Sensing, Geography Information System (GIS) and Global Navigation Satelite System. This outreach programme is conducted as five modules. Module 1 deals with Basics of RS, GIS and GNSS. Module 2 deals with Global Navigation Satellite Systems. Module 3 deals with Geographical Information System. Module 4 is on Basics of Geocomputation and Geoweb Services. Module 5 is on RS & GIS applications.
This outreach programme covered the following topics:

Basic Principles of Remote Sensing, Earth Observation Sensors and Platforms, Spectral Signatures of Different Land cover Features and Visual Image, Digital Image Processing: Basic Concepts Rectification and Registration, Enhancement techniques Image, RS and Image Interpretation Practical, Image Classification Techniques and Accuracy Assessment, Thermal Remote Sensing, Digital Change Detection, GEE Application Programming Interface: Introduction and Case Studies Demo, Hyperspectral Remote Sensing, Basics of SAR Remote Sensing, Basics of LIDAR Remote Sensing, Basics of UAV Remote Sensing, GPS receivers, processing methods, errors and accuracy, Satellites based Augmentation systems & GPS Aided and GEO Augmented Navigation (GAGAN), GPS signal characteristics, Data formats (broadcast, precise ephemeris), Indian Regional

Navigation Satellite System (IRNSS), DGPS demonstration (Pre-recorded followed by live query session), Advance GNSS processing, Geographic Phenomena, Concepts and examples, Data Inputting and Editing in GIS, GIS Data Models (Spatial and Non spatial), Map Projection Concepts & Use in RS & GIS, Uncertainty in GIS and Error Propagation, Advanced Geospatial Modeling, Recent Trends in Geoinformatics, Programming concepts for Geo-computation- Introduction to Python and R, Basics of cyber infrastructure requirement for GIS, computing, storage, archive, network and firewall infrastructure in GIS lab. Finally, a panel discussion is held at the end of each module for the participants with the expert members. All the participants actively participated in the panel discussion. A total of 11 members from different disciplines have participated in this programme.

Dr. V. V. Satyanarayana Tallapragada, Associate Professor has coordinated this event under the guidance of Dr. P. V. Ramana, Professor and Head, Department of Electronics and Communication Engineering.

Convener

Announcement Brochure

IIRS Outreach Programme

Basics of Remote Sensing, Geographical Information System and Global Navigation Satellite System

*There are limited number of seats. Registration will be done on first come first serve basis

August 17- November 20, 2020

Organised by
Indian Institute of Remote Sensing
Indian Space Research Organisation
Department of Space, Govt. of India
Dehradun

Govt. of India
Department Space
Indian Space Research Organization
Indian Institute of Remote Sensing

Sixty Fourth IIRS Outreach Programme
On
Basic of RS, GIS & GNSS

Tentative Course Schedule

S. No.	Course Name	Module Name	From	To
1.	Basic of RS, GIS & GNSS	Complete Basic Course	17-08-2020	20-11-2020
2.	Remote Sensing & Digital Image Analysis	Module-1	17-08-2020	11-09-2020
3.	Global Navigation Satellite System	Module-2	14-09-2020	25-09-2020
4.	Geographical Information System Module	Module-3	28-09-2020	16-10-2020
5.	Basics of Geocomputation and Geoweb Services	Module- 4	19-10-2020	29-10-2020
6.	RS & GIS Applications	Module-5	02-11-2020	20-11-2020

Module-1 Completed
Modue-2 in progress
Module-3 in progress

Module 1: Remote Sensing & Digital Image Analysis
Module/ Course Coordinator: Mrs. Minakshi Kumar

Duration of the Course: 17 August-11 September 2020

Course Name: Remote Sensing & Digital Image Analysis
Course Coordinator: Mrs. Minakshi Kumar

17 August-11 September

Date	Day	Time	Topic	Speaker
17/08/2020	Monday	1600-1730 hrs	Course Inauguration and Introductory Lecture , Indian Space Programme	Dr. Prakash Chauhan
18/08/2020	Tuesday	1600-1700 hrs 1700-1730 hrs	Basic Principles of Remote Sensing Interactive Session	Ms. Manu Mehta
19/08/2020	Wednesday	1600-1700 hrs 1700-1730 hrs	Earth Observation Sensors and Platforms Interactive Session	Mr. Vinay Kumar
24/08/2020	Monday	1500-1545 hrs 1545-1600 hrs	Spectral Signatures of Different Land cover Features and Visual Image interpretation Interactive Session	Dr. Hina Pande
24/08/2020	Monday	1605-1700 hrs 1700-1730 hrs	Digital Image Processing: Basic Concepts Rectification and Registration Interactive Session	Ms. Minakshi Kumar
25/08/2020	Tuesday	1500-1545 hrs 1545-1600 hrs	Enhancement techniques Image Interactive Session	Dr. Poonam S. Tiwari
25/08/2020	Tuesday	Offline Session	RS and Image Interpretation Practical	Self-Practice by participants / Assignment
26/08/2020	Wednesday	1500-1545 hrs 1545-1600 hrs	Image Classification Techniques and Accuracy Assessment Part 1 Interactive Session	Dr. Poonam S. Tiwari
26/08/2020	Wednesday	1605-1700 hrs 1700-1730 hrs	Thermal Remote Sensing	Dr. Yogesh Kant
27/08/2020	Thursday	1600-1700 hrs 1700-1730 hrs	Image Classification Techniques and Accuracy Assessment Part 2 Interactive Session	Dr. Poonam S. Tiwari
28/08/2020	Friday	1600-1700 hrs 1700-1730 hrs	Digital Change Detection Interactive Session	Ms. Minakshi Kumar
31/08/2020	Monday		Onam Festival	

Date	Day	Time	Topic	Speaker
01/09/2020	Tuesday	1600-1730 Hrs	GEE Application Programming Interface: Introduction and Case Studies Demo	Ms. Supriya sharma
02/09/2020	Wednesday	1600-1700 hrs 1700-1730 hrs	Hyperspectral Remote Sensing Interactive Session	Mr. Vinay Kumar
03/09/2020	Thursday	1600-1700 hrs 1700-1730 hrs	Demonstration: Image Processing Software Interactive Session	Ms. Minakshi Kumar
04/09/2020	Friday	1600-1700 hrs 1700-1730 hrs	Basics of SAR Remote Sensing Interactive Session	Mr. Shashi Kumar
07/09/2020	Monday	1600-1700 hrs 1700-1730 hrs	Basics of SAR Data Processing Interactive Session	Ashish Joshi
08/09/2020	Tuesday	1600-1700 hrs 1700-1730 hrs	Basics of LIDAR Remote Sensing Interactive Session	Dr. Hina Pande
04/09/2020 07/09/2020 08/09/2020	Friday , Monday & Tuesday	Offline Session	Image Processing Hands-on practice	Self-Practice by participants / Assignment
10/09/2020	Thursday	1600-1700 hrs 1700-1730 hrs	Basics of UAV Remote Sensing Interactive Session	Mrs. Shefali Agrawal
11/09/2020	Friday	1600-1730 hrs	Panel Discussion/Query Session	All the faculty

Module- 2: Global Navigation Satellite System
Module/ Course Coordinator: Dr. Ashutosh Bhardwaj

Date	Day	Time	Topic	Speaker
14/09/2020	Monday	1600-1700 hrs	Introduction to GPS and GNSS	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
15/09/2020	Tuesday	1600-1700 hrs	GPS receivers, processing methods, errors and accuracy	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
17/09/2020	Thursdays	1600-1700 hrs	Satellites based Augmentation systems & GPS Aided and GEO Augmented Navigation (GAGAN)	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
18/09/2020	Friday	1600-1700 hrs	GPS signal characteristics, Data formats (broadcast, precise ephemeris)	Dr. Ashutosh Bhardwaj & Shri Ashish Joshi
		1700-1730 hrs	Interactive Session	
21/09/2020	Monday	1600-1700 hrs	Indian Regional Navigation Satellite System (IRNSS)	Dr. Ashutosh Bhardwaj & Shri Kamal Pandey
		1700-1730 hrs	Interactive Session	
22/09/2020	Tuesday	1600-1700 hrs	DGPS demonstration (Pre-recorded followed by live query session)	Offline
		1700-1730 hrs	Interactive Session	
				Dr. Ashutosh Bhardwaj
24/09/2020	Thursdays	1600-1700 hrs	Advance GNSS processing	Shri Suresh Kannaujiya
		1700-1730 hrs	Interactive Session	
25/09/2020	Friday	**Paned Discussion**		

Module- 3: Geographical Information System
Module/ Course Module/Course Coordinator: Shri. Prabakar Alok Verma

Date	Day	Time	Topic	Speaker
28/09/2020	Monday	1600-1705 hrs 1705-1730 hrs	Introduction to GIS Interactive Session	Dr. Sameer Saran
29/09/2020	Tuesday	1600-1640 hrs 1645-1705 hrs 1705-1730 hrs	Geographic Phenomena, Concepts and examples Practical/Image/Video based Demonstrations Interactive Session	Shri Prasun Kumar Gupta
30/09/2020	Wednesday	1600-1640 hrs 1645-1705 hrs 1705-1730 hrs	Data Inputting and Editing in GIS Practical/Image/Video based Demonstrations Interactive Session	Shri K. Shiva Reddy
01/10/2020	Thursday	1600-1640 hrs 1645-1705 hrs 1705-1730 hrs	GIS Data Models (Spatial and Non spatial) Practical/Image/Video based Demonstrations Interactive Session	Shri Ashutosh Kumar Jha
05/10/2020	Monday	1600-1640 hrs 1645-1705 hrs 1705-1730 hrs	Map Projection Concepts & Use in RS & GIS Practical/Image/Video based Demonstrations Interactive Session	Dr. Ashutosh Srivastav
06/10/2020	Tuesday	1600-1640 hrs 1645-1705 hrs 1705-1730 hrs	Spatial Analysis - Introductory Concepts and Overview Practical/Image/Video based Demonstrations Interactive Session	Shri Prabhakar Alok Verma
07/10/2020	Wednesday	1600-1640 hrs 1645-1705 hrs 1705-1730 hrs	Spatial Analysis - Functionality and Tools Practical/Image/Video based Demonstrations Interactive Session	Shri Kapil Oberai
08/10/2020	Thursday	1600-1730 hrs	Open Source Software Technology & Tools	Shri Prasun Kumar Gupta
09/10/2020	Friday	1600-1640 hrs 1645-1705 hrs 1705-1730 hrs	Uncertainty in GIS and Error Propagation Practical/Image/Video based Demonstrations Interactive Session	Shri Prabhakar Alok Verma
12/10/2020	Monday	1600-1640 hrs 1645-1705 hrs 1705-1730 hrs	Advanced Geospatial Modeling Practical/Image/Video based Demonstrations Interactive Session	Shri Ashutosh Kumar Jha
13/10/2020	Tuesday	1600-1640 hrs 1645-1730 hrs	Overview of Big Data Analytics Overview of Machine Learning for GIS	Shri Kapil Oberai Shri Prabhakar Alok Verma
14/10/2020	Wednesday	1600-1730 hrs	Recent Trends in Geoinformatics	Dr. Sameer Saran
15/10/2020	Thursday	1600-1730 hrs	Panel Discussion of Module 3	All Module -3 Faculty

Module Name- Basics of Geocomputation and Geoweb Services
Module/ Course Module/Course Coordinator: Shri. Kamal Pandey

Date	Day	Time	Topic	Speaker
19/10/2020	Monday	1600-1700hrs	Introduction to Geocomputation- Technology and applications	Dr. Harish C. Karnatak
		1700-1730 hrs	Interactive Session	
20/10/2020	Tuesday	1600-1700hrs	Introduction to online GIS and Geo-web services Interactive Session	Dr. Harish C. Karnatak
		1700-1730 hrs		
21/10/2020	Wednesday	1600-1700hrs	Open Geodata Repositories & ISRO Geoweb Services for thematic applications	Shri Kamal Pandey
		1700-1730 hrs	Interactive Session	
22/10/2020	Thursdays	1600-1700hrs	Programming concepts for Geo-computation- Introduction to Python and R	Shri Ravi Bhandari
		1700-1730 hrs	Interactive Session	
23/10/2020	Friday	1600-1700hrs	Overview on concept of DBMS, RDBMS and SDBMS for geo-data handling	Shri Dharmendra Kumar
		1700-1730 hrs	Interactive Session	
26/10/2020	Monday	1600-1700hrs	Basics of cyber infrastructure requirement for GIS, computing, storage, archive, network and firewall infrastructure in GIS lab	Shri Dharmendra Kumar
		1700-1730 hrs	Interactive Session	
27/10/2020	Tuesday	1600-1700hrs	Crowdsourcing and participatory GIS using online tools & technologies	Shri Kamal Pandey
		1700-1730 hrs	Interactive Session	
28/10/2020	Wednesday	1600-1700hrs	Practical Demonstration on: Virtual reality, 2D and 3D geo-visualizations in web platforms	Dr. Harish C Karnatak
		1700-1730 hrs	Interactive Session	
29/10/2020	Thursdays	1600-1700hrs	Practical Demonstration on Introduction to Cloud GIS	Shri Ravi Bhandari
		1700-1730 hrs	Interactive Session	

Module/Course Name- RS & GIS Applications
Module/ Course Coordinator: Shri C.M. Bhatt

Date	Day	Time	Topic	Speaker
02/11/2020	Monday	1600-1730 hrs	Applications of Remote Sensing & other Geospatial Technologies in Natural Resources Management, Development & Governance	Dr. S. K Srivastav
03/11/2020	Tuesday	1600-1730 hrs	Remote Sensing and GIS applications for Crop Resource Assessment and Monitoring	Dr. N.R. Patel
05/11/2020	Wednesday	1600-1730 hrs	RS & GIS for Coastal Zone Management	Dr. D. Mitra
06/11/2020	Thursdays	1600-1730 hrs	Remote Sensing Applications for Geological studies	Dr. R.S. Chatterjee
09/11/2020	Monday	1600-1730 hrs	Space-enabled Products & Services for Disaster Management :Indian Initiatives	Dr. P.K.C.Ray
10/11/2020	Tuesday	1600-1730 hrs	RS & GIS Application in Urban & Regional Planning	Shri. Pramod Kumar
11/11/2020	Wednesday	1600-1730 hrs	Remote Sensing Application to Atmospheric & Marine Environment	Dr. A.K Mishra
12/11/2020	Thursdays	1600-1730 hrs	RS & GIS Applications in Forestry and Ecology	Dr. Hitendra Padalia
16/11/2020	Monday	1600 – 1730 hrs	RS applications for Planetary Studies	Dr. Prakash Chauhan
17/11/2020	Tuesday	1600-1730 hrs	RS & GIS Applications to Water Resources Management	Dr. S.P Aggarwal
18/11/2020	Wednesday	1600-1730 hrs	Geospatial Technology for climate change studies	Dr. Arijit Roy
19/11/2020	Thursdays	1600-1730 hrs	RS and GIS Applications in Soil Resource Management	Dr. Suresh Kumar
20/11/2020	Friday	1600-1730 hrs	Panel Discussion Module-3	All speakers

Note: Details about the course, examination and latest schedule will be updated on below link: