

# IIRS Outreach Programme

The IIRS outreach programme, which started in 2007 with 12 universities/ institutions has now grown substantially. Currently, 561 universities / institutions spread across India covering 30 States and 2 Union Territories are networked with IIRS. The beneficiaries of the programme may include:

- Central/State/Private Universities & Academic Institutions
- Central & State Government Departments
- Forest Resource Professionals
- State Forest Departments/Forest Training Academies
- Research Institutes
- Geospatial Industries
- NGOs

## Feedback Mechanism

IIRS has conducted six workshops in 2007, 2009, 2010, 2013, 2014, 2015, 2016 and 2017 to take feedback from participating institutions to improve the quality of future courses.



Seventh outreach programme feedback session during IIRS User Interaction Meet (IUIIM)-2017

## Awards

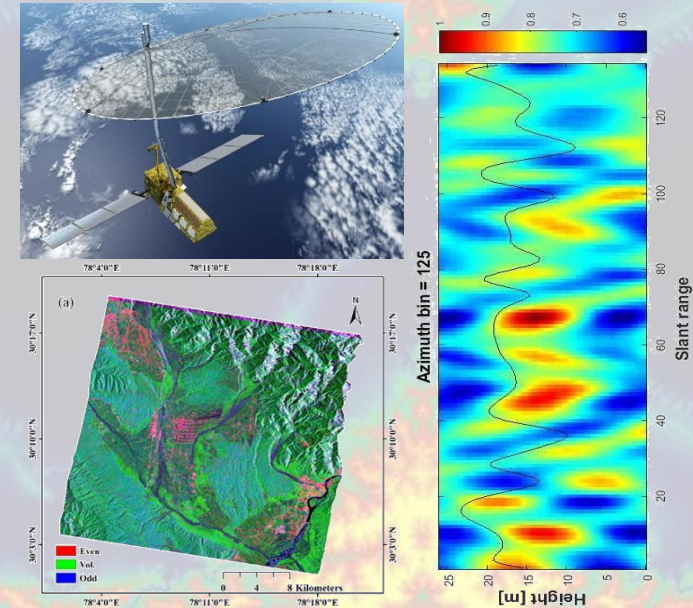
IIRS has received national awards for excellence in training for outreach and e-learning programme during 1st National Symposium on Excellence in Training conducted during April 11-12, 2015 in New Delhi by Department of Personnel & Training (DoPT), Govt. of India in collaboration with United Nations Development Programme (UNDP).

# About IIRS

Indian Institute of Remote Sensing (IIRS) under Indian Space Research Organisation (ISRO), Department of Space, Govt. of India is a premier Training and Educational Institute set up for developing trained professionals in the field of Remote Sensing, Geoinformatics and GNSS Technology for Natural Resources, Environmental and Disaster Management. Formerly known as Indian Photo-interpretation Institute (IPI), founded in 1966, the Institute boasts to be the first of its kind in entire South-East Asia. While nurturing its primary endeavour to build capacity among the user community by training mid-career professionals, the Institute has enhanced its capability and evolved many training and education programmes that are tuned to meet the requirements of various target groups, ranging from fresh graduates to policy makers including academia.

IIRS also conducts e-learning programme on Remote Sensing and Geoinformation Science (<http://elearning.iirs.gov.in>).

# Twentieth IIRS Outreach Programme



## Microwave Radar Remote Sensing and its Applications

April 10-28, 2017



Organised by

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

[www.iirs.gov.in](http://www.iirs.gov.in)

## Contact Details

**Dr. R. S. Chatterjee**  
 Course Director  
 Tel: 0135-2524156  
 Email: [rschatterjee@iirs.gov.in](mailto:rschatterjee@iirs.gov.in)

**Mr. Shashi Kumar**  
 Course Coordinator  
 Tel: 0135-2524119  
 Email: [shashi@iirs.gov.in](mailto:shashi@iirs.gov.in)

### IIRS DLP Team

**Dr. Harish Karnatak**  
 Head, GIT & DL Dept.  
 Tel: 0135-2524332  
 Email: [harish@iirs.gov.in](mailto:harish@iirs.gov.in)

**Dr. Poonam S Tiwari**  
 Tel: 0135-2524115; email: [poonam@iirs.gov.in](mailto:poonam@iirs.gov.in)

**Mr. Janardan Vishwakarma**  
 Tel: 0135-2524130; email: [janardan@iirs.gov.in](mailto:janardan@iirs.gov.in)

**Mr. Ashok Ghildiyal**  
 Tel: 0135-2524130; email: [ashok@iirs.gov.in](mailto:ashok@iirs.gov.in)

**Indian Institute of Remote Sensing,**  
 Indian Space Research Organisation  
 Department of Space, Govt. of India,  
 4-Kalidas Road, Dehradun  
 Email: [dip@iirs.gov.in](mailto:dip@iirs.gov.in) / [edusat2004@gmail.com](mailto:edusat2004@gmail.com)





## About the Course

The advancement of earth observation has opened new avenues of research in the field of earth sciences. With the technological advancements in geo-information sciences, remote sensing has become an effective method for detection and investigation of various factors. The visible and infra-red regions are known as optical regions, and the microwave region (1mm - 1m) is considered as non-optical region. Systems operating in optical region are being used for several decades and therefore, are more advanced and widely employed. However, their use is limited by availability of sunlight and interference of the atmospheric conditions such as haze and cloud cover especially in the tropical regions. Therefore, the use of microwave or radar remote sensing is preferred in such areas. Radar imaging through Synthetic Aperture Radar (SAR) systems has revolutionized and expanded the technology of Microwave remote sensing especially in geosciences applications using different techniques like SAR Polarimetry (PolSAR), SAR Interferometry (InSAR) and Polarimetric SAR Interferometry (PolInSAR). SAR systems in general helps in understanding glacier and ice movement to give better understanding on long term variation in climate, developing highly accurate and detailed elevation maps, flood and oil spill monitoring, land use and land cover change, soil moisture and biomass estimation, assessing the health of crops and forests and even in urban planning and development.

## Curriculum

The course structure is spread into 4 broad topics of teaching on:

- Basics of SAR remote sensing
- SAR Interferometry (InSAR)
- SAR Polarimetry (PolSAR)
- SAR Remote Sensing Applications

Following topics will be covered in this course

- Overview of SAR Remote Sensing
- SAR Data Format and Acquisition Mode
- SAR Data Processing
- Basic concepts of SAR Interferometry
- Polarimetric SAR Remote Sensing and Applications
- Forest Parameter Retrieval using SAR Remote Sensing

- SAR Remote Sensing for Snow and Glacier studies
- SAR Remote Sensing for Flood Mapping and Monitoring
- SAR Remote Sensing for Coastal and Oceans Studies
- SAR Remote Sensing for Agricultural and Soil Studies
- SAR Remote Sensing for Geological Studies

## Target Participants

The candidates who want to participate in the course should be a student of final year undergraduate course or postgraduate course (any year). Technical/Scientific Staff of Central/State Government/Faculty/researchers at university/institutions are also eligible to apply for this course. Applications of participants have to be duly sponsored by university/institute and forwarded through coordinators from respective centres. Users receiving programmes under CEC-UGC/ CIET networks can also participate. Institutions on high speed National Knowledge Network (NKN) can also participate using A-VIEW software.

## Course Study Material

Course study materials like lecture slides, video recorded lectures, open source software & handouts of demonstrations, etc. will be made available through IIRS ftp link. Video lectures will also be uploaded on YouTube Channel (<http://www.youtube.com/user/edusat2004>).

## Course Fee

There is no course fee.

## Course Registration

- Course updates and other details will be available on URL- <http://www.iirs.gov.in/Edusat-News/>.
- To participate in this programme the interested organizations/ universities/ departments/ Institutes has to identify a coordinator at their end. The identified coordinator will register online his/her Institute as nodal center in IIRS website.
- All the participants has to register online through registration page by selecting his/her organization as nodal center.

## Course Funding & Technical Support

The programme is sponsored by National Natural Resources Management System – Standing Committee on Training and Education (SC-T), Indian Space Research Organisation, Department of Space, Government of India and is conducted with due technical support from Amrita Virtual Interactive E-learning World (A-VIEW).

## Programme Reception

Programme can be received through Internet connectivity of 2Mbps or better. Following hardware and software set-up is required at user end:

### Hardware Requirements :

- High-end Computer/Laptop (Windows OS);
- Good quality web camera ;
- Headphone with Microphone;
- Speakers ;
- Large Display Screen (Projector or TV) .

### Software and Internet Requirements

- Desktop based: A-VIEW software (free to download from [www.aview.in](http://www.aview.in) or IIRS ftp link: <ftp://ftp.iirs.gov.in>)
- Online live access through <http://live.iirs.gov.in> with free registration.

### Connectivity & Other configurations:

- NKN or any other high speed internet facility (preferably without firewall, with minimum of 2 Mbps bandwidth)
- Network requirements: Port 80 and RTMP (port 1935) protocol should be unblocked from user's computer and Firewall.

**Note:** Institutions/ universities have to bear total expenses for establishment of the classroom facility

## Award of Certificate

**Working Professionals:** Based on 70% attendance and submission of assignments.

**Students:** Based 70% attendance and online examination.