IIRS Outreach Programme
The IIRS outreach programme, which was started in 2007 with 12 universities/ institutions has now grown substantially. Currently, 900+ 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 Disaster Management Centers
- State Remote Sensing Departments
- Research Institutes
- Earthquake engineering/geotechnical industries
- NGOs

Feedback Mechanism
The participants can submit their feedback through online portal. Feedbacks are critically analyzed and implemented in next courses. For one to one feedback the participants and participating organizations are invited to attend annual IIRS User Interactive Meet (IUIM) at IIRS Dehradun.

Awards of Appreciation
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 (https://elearning.iirs.gov.in).

Contact Details
Dr. R.S. Chatterjee
Course Director
Tel: 0135-2524156
Email: rschatterjee@iirs.gov.in

Dr. Shovan L. Chatteraj
Course Coordinator
Tel: 0135-2524157
Email: shovan@iirs.gov.in

IIRS DLP Team
Dr. Harish Kannan
Head, GIT& DL Dept.
Tel: 0135-2524332

Dr. Poonam S Tiwari
Tel: 0135-2524334

Mr. Janardan Vishwasharma

Mr. Ashok Ghildiyal
Tel: 0135-2524130

Indian Institute of Remote Sensing,
Indian Space Research Organisation
Department of Space, Govt. of India,
4-Kalidas Road, Dehradun
Email: dl@iirs.gov.in

Remote Sensing based Mapping,
Monitoring and Modelling of Landslide and Earthquake
Hazards
April 22-26, 2019

Organised by
Indian Institute of Remote Sensing
Indian Space Research Organisation
Department of Space, Govt. of India
Dehradun
www.iirs.gov.in
About the Course
Earthquakes and landslides are the major geological hazards that have maximum destructive effect in the Himalayan states of India. Landslides, around the globe, owe to a wide variety of causative as well as triggering factors like heavy rainstorms, cloudbursts, earthquakes, geo-engineering setting and unplanned human activities. In recent years, multiple remote sensing techniques from spaceborne, airborne, and ground-based platforms, have been widely applied for the monitoring of landslide processes. Current techniques include automated detection, surface deformation monitoring, utilization of high resolution data among others. In addition, landslide susceptibility mapping, hazard assessment, and risk evaluation can be further improved by multi-sensor remote sensing data fusion integrating UAV and ground-based observations. Comprehensive assessment of landslide hazard which requires process based modeling using numerical simulation methods is at a preliminary stage in India. Precipitation triggered landslide models have been attempted in tectonically disturbed regions. Collision-related seismicity across this region has caused hundreds of thousands of deaths and catastrophic economic losses in this area. Spaceborne geodetic observation by Differential Interferometric SAR (DinSAR) and DGNSS techniques facilitate to measure co-seismic and interseismic land surface deformations, crustal shortening and identification of strain accumulation zones in and around major tectonic features. In order to assess the seismic hazard, it is also important to consider ground based measurements to achieve highest precision. Ground based measurements with the aid of GNSS CORS receivers are capable of providing temporal ground deformation and strain accumulation which is the prime factors for earthquake occurrences. Modeling of GNSS data can provide information on crustal deformation, shortening, slip deficit, rate, coupling, dilatation, shear strain, principal strain, strain rate etc. Geophysical techniques using Ground penetration radar (GPR), ERT techniques are used for detection of active faults. Assessment of liquefaction hazards and detailed seismic micro-zonation using remote sensing and GIS techniques has been another area of active research in the last decade. Accurate assessment of the earthquake hazard is a critical step for earthquake risk mitigation and therefore, there is an urgent need for multi parametric earthquake precursory study based on current seismicity observations which will augment space based observations based on VLF, TEC and thermal data analysis.

Curriculum
Role of RS and GIS in landslide and earthquake hazards study
Mass movement types and classifications of landslides
Rainfall and seismicity induced landslide modeling
Landslide modelling using geotechnical inputs: Rock fall and debris flow modelling
Geodynamics of the Himalaya
Neotectonics & active tectonics: Morphotectonics study of the Himalaya
Geophysical investigation of active tectonics
Coseismic and interseismic land surface displacement monitoring by spaceborne geodetic techniques
Ground based measurements using GNSS CORS receivers for crustal deformation and strain accumulation.
Liquefaction hazards modelling (SLC)
Seismic hazard zonation and microzonation using remote sensing and GIS techniques

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.

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
The Course is free of cost.

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

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:
- IIRS Learning Management System.

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 on 70% attendance and scoring 40% marks in online examination.