

# Indian Institute of Remote Sensing (IIRS) आई.आई.आर.एस.



**Activities**  
गतिविधियाँ

**Indian Institute of Remote Sensing (IIRS)**, a unit of Indian Space Research Organisation (ISRO), Dept. of Space (DOS), Govt. of India is a premier training, education and research organization established to prepare professionals in the field of Remote Sensing, Geoinformatics and GPS technologies, and their applications.

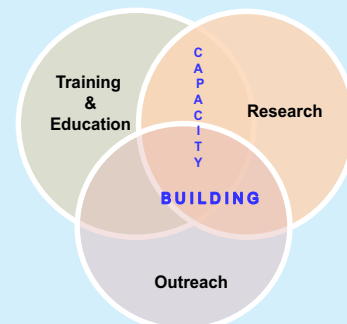
## BACKGROUND

- Formerly known as Indian Photo-Interpretation Institute (IPI), established in 1966 under the aegis of Survey of India (SOI), DST in collaboration with Govt. of The Netherlands
- Merged with National Remote Sensing Agency (NRSA), Dept. of Space in the year 1976
- Renamed as Indian Institute of Remote Sensing (IIRS) in 1983
- Became an independent Unit of ISRO, Dept. of Space with effect from April 30, 2011



## Vision

*"Achieve excellence and remain in the forefront for capacity building in Remote Sensing and Geoinformatics and their applications"*



## PARTICIPATION IN NATIONAL MISSION PROJECTS

- Landslide Hazard Zonation (Parts of Uttarakhand and Himachal Pradesh)
- National Biodiversity Characterization Project
- Geomorphological and Lineament Mapping at 1:50,000 scale (Northern States)
- National Urban Information System (Nahan, Solan and Shimla towns of Himachal Pradesh)
- Land Degradation Mapping at 1:50,000 Scale (Uttarakhand, Uttar Pradesh and Andaman & Nicobar Islands)
- National Carbon Project under ISRO-Geosphere Biosphere Programme
- Land Use/ Land Cover Mapping on 1:2,50,000 scale (Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab and Uttarakhand) and 1:50,000 scale (Haryana and Andaman & Nicobar Islands)
- Groundwater Prospects Mapping at 1: 50,000 scale under Rajiv Gandhi National Drinking Water Mission (Chhattisgarh, Madhya Pradesh, Himachal Pradesh, Rajasthan and Uttarakhand)
- Establishment of Village Resource Centres (Himachal Pradesh, Uttarakhand and Uttar Pradesh)
- Monitoring and Assessment of Ecosystem Processes in North West Himalaya

## THRUST AREAS OF RESEARCH

- Hyperspectral and Microwave Remote Sensing
- Satellite and Terrestrial Photogrammetry
- Geospatial Data Modelling, Geo-visualisation and WebGIS
- Monitoring and Assessment of Ecosystem Processes and Services in Western Himalaya
- Measurement, Modelling and Assessment of Carbon Pools and Fluxes
- Land Surface Processes Parametrization and Modelling
- Land Use and Land Cover Change (LULCC) Modelling and Assessing its Impact along with Climate Variability/ Change on Water Resources
- Mapping, Monitoring and Modelling of Geological Hazards and their Vulnerability and Risk Assessment
- Planetary Geoscience
- Climate Change impact on Biodiversity
- Biomass/Carbon assessment using LiDAR, Hyperspectral and Microwave data
- Forest Ecosystem services

## EDUCATION / TRAINING PROGRAMMES

### Educational Programmes

M.Tech. in RS & GIS

M.Sc. in GFM

### Training Programmes on RS&GIS

Post Graduate Diploma in RS & GIS (10 months)

Certificate Programmes (Sponsored by ITEC, MEA) - (8 weeks twice a year)

NNRMS-ISRO Sponsored Certificate Course for University Faculty (8 weeks)

Decision Makers Course (4 days)

User defined Special / Tailor-made courses (1-8 weeks)

## MAJOR ACHIEVEMENTS - TILL JUNE, 2018

- Professionals trained / enrolled: **11, 217**
- Foreign participants trained: **1151** from 96 Countries (excluding CSSTEAP)
- M.Tech. (293) / M.Sc. (190) students: **483** (since 2002)
- Customized courses: **3,857** participants
- IIRS Outreach Programme (DLP)
  - Live & interactive Programme: **62143** participants (730 Institutions)
  - E-learning: Learners- **4187**
- Registered for Certificates- **943**
- Certificates Issued - **77**

## HOSTING OF CSSTEAP

- Hosting Headquarters of CSSTEAP (Affil. to UN)
- Conducting PGD/ M.Tech. in RS&GIS and Short courses

## FACILITIES

- State-of-the-art Digital Image Processing, GIS, Digital Photogrammetry & Thematic Applications Laboratories
- Latest Remote Sensing and Ground Truth collection instruments
- Field observations for Soil Erosion & Hydrological Modelling, Carbon Fluxes, Landslide studies, Aerosol Characterization, Vegetation Climate Change Studies, Niche modelling for species shift, etc.
- Studio for Distance Learning Programmes
- Satellite Data Archives & Instrumentation Facility
- Central Library
- Carbon Flux Tower
- Spacenet
- Hostels

## COLLABORATIONS

- ITC, Twente University, The Netherlands
- Wageningen University, The Netherlands
- Collaborations with Premier Institutes in the Country
- WGCapD Committee on EO Satellites
- Kumaon University
- Doon University, etc.

## ACTIVITIES IN THE CAMPUS



## FACULTY AND SPECIALIZATION - PPEG

- Dr. Hari Shanker Srivastava**, Group Head, PPEG & Sc / Engr-SG  
Microwave RS for various land resources
- Dr. Puneet Swaroop**, Head BPMD & Sc/ Engr - SF  
Techno-Management & Finance
- Mr. Dharmendar Kr.**, Sc/ Engr - SE  
COWAA/COINS Software
- Dr. Swati Swaroop**, Sc/ Engr - SD  
HRD & Student Affairs

Group Head, Programme Planning & Evaluation Group  
IIRS, ISRO, Department of Space, Govt. of India  
4-Kalidas Road, Dehradun-248001  
Tel No.: 0135-2524105 / 7 / 6/ 9/ 8

For further details visit us at [www.iirs.gov.in](http://www.iirs.gov.in)



**Agriculture & Soils Department (ASD)** formerly known as “Soils Division”, is one of the oldest divisions of the institute, it was first to start Post Graduate Diploma course along with Forestry and Geosciences divisions in 1966. The Department is involved in training, education and carrying out research and operational projects in the field of remote sensing and GIS applications such as crop inventory and crop production forecasting, satellite agrometeorology, soil resource inventory, land use planning, land degradation survey, soil erosion assessment, watershed management and climate change impact assessment on agriculture.

## REGULAR COURSES

- **M. Tech.** in RS & GIS
- **P.G. Diploma** in RS & GIS Applications CSSTEAP (UN)
- **P.G. Diploma** in RS & GIS Applications
- **NNRMS Course:** Soils & Land Use Planning (8 Weeks)

## SPECIAL COURSES

- Geospatial Technologies for Watershed Management
- Monitoring of IWMP watersheds using Geospatial data and Bhuvan Web Services
- RS and GIS for Mapping of Salt-affected Soils
- Geospatial Technologies in Veterinary Epidemiology and Disease Informatics
- Satellite observations and products for Agro-meteorological applications
- Remote sensing and GIS for crop growth monitoring & yield prediction (IMD Sponsored)
- Special courses in Remote Sensing and GIS Applications for Tajikistan officials (i.) Land Resource Management (ii.) Agricultural Resource Management

## RESEARCH AREAS

- **Crop yield forecasting** using satellite derived parameters and crop growth simulation models
- **Satellite Agro-meteorology:** Remote sensing of energy, water vapor and CO<sub>2</sub> exchange processes
- **Land surface processes** parameterization and atmospheric coupling
- **Monitoring and assessment of agro-hazard** (drought, land degradation and pests & diseases)
- **Process based modeling** for soil & nutrient loss at watershed scale
- **Soil quality assessment** in relation to land degradation in mountain ecosystem
- **Digital soil mapping** for hilly terrains
- **Hyperspectral remote sensing** in soil quality and land degradation
- **Microwave satellite data** in crops and soil studies

## FACULTY AND SPECIALIZATION

- Dr. Suresh Kumar**, Group Head and Scientist –SG  
Soil Resource Mapping, Land Evaluation, Watershed Management
- Dr. N. R. Patel**, Scientist –SG  
Satellite agro-meteorology, Terrestrial carbon cycle and drought assessment
- Dr. Hari Shanker Srivastava**, Scientist – SG  
Microwave remote sensing for Crop & Soil moisture
- Mr. Justin George K**, Scientist – SD  
Land Degradation, Hyperspectral RS in Soils, Digital Soil Mapping
- Mr. Abhishek Danodia**, Scientist – SC  
Agrometeorology, Agricultural Physics, Evapotranspiration Modelling
- Mr. Yogesh S. Ghotekar**, Sr. Scientific Assistant, Central Analytical Lab

## PROJECTS

- **National Soil Carbon Stock Assessment** (NCS-SCP Phase – I) (ISRO-IGBP)
- **Soil Carbon Dynamics (SCD)** (NCP- SCP) Phase II (Soil Carbon Dynamic Studies in the North hilly and Mountainous region (ISRO-IGBP)
- **Soil- Vegetation- Carbon Flux Phase II** (Developing parameterization and RS based scaling techniques for ecosystem respiration using satellite data over forest sites) (EOAM)
- **Mountain Ecosystem Processes and Services:** Sustainable Mountain Agriculture (i.) Assessing Soil Erosion and Nutrient Loss and its impact on Soil Quality and Crop Productivity (ii.) Climate Change impact on Productivity of food grains and plantation crops (EOAM)
- **RISAT-1 Hybrid polarimetric SAR data** in monitoring of crop growth and soil moisture using (EOAM)
- **Crop and Soil Studies using Space Borne Hyperspectral and microwave data** (TDP)
- **Developing a Framework For Hydro-pedological Studies** Using GPR And Remote Sensing Data (TDP)
- **Calibration and Validation of RISAT-1 SAR sensor and RISAT-1 derived soil moisture** (Collaborative Project: IIRS-SAC)
- **Energy balance studies using Large Aperture Scintillometry** (Collaborative Project: IIRS & ICAR-IARI)

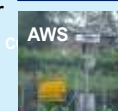
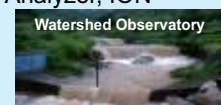
## INFRASTRUCTURE / INSTRUMENTS

Computer lab with advance computing facilities

**Central Analytical Lab:** CHNS & TOC Analyzer, ION Chromatograph

**Field and lab instruments:**

- **Eddy covariance system**
- **Instrumented Watershed Observatory**
- **Large Aperture Scintillometry**
- Portable photosynthesis system
- Soil CO<sub>2</sub> flux system
- Plant canopy analyzer
- Infiltrometer, Guelph permeability meter,
- Profile soil moisture and salinity probe
- Wet sieving apparatus, Soil moisture sensor
- Suspended Soil Analyzer
- Hand Penetrometer
- Microwave digestion system & Auto titrator
- Spectrophotometer and Flame Photometer
- Gas chromatography System



Group Head, Agriculture & Soils Department  
IIRS, ISRO, Department of Space, Govt. of India  
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**Geoinformatics Department (GID)** is one of the technological departments of IIRS, established in 1996 in collaboration with the Faculty of Geo-Information Science and Earth Observation (ITC) of the University of Twente, The Netherlands. Technology development and research in the areas of GIS, Transportation GIS, 3D GIS, Health GIS, data mining, distributed GIS, crowdsourcing and location based services are the main focus of the department. The department has recently initiated the design of low cost sensors. The Department offers long term (M.Sc, M.Tech & PGD) and organises special/ tailor-made courses.

## REGULAR COURSES

- M. Tech in RS & GIS (Specialization Geoinformatics)
- M.Sc. & PGD in Geoinformation Science & Earth Observation (Spl. in Geoinformatics) IIRS-ITC JEP
- P.G. Diploma Course in RS & GIS of CSSTEAP (UN)
- ISRO-NNRMS sponsored course on RS & GIS for University / Institute / College Faculty
- ITEC sponsored short course on Geoinformatics

## SPECIAL COURSES

- ISPRS Summer School - 2017
- Special course for the officials of ISRO/DOS - 2016
- Special course for the officials of Ministry of AYUSH - 2016
- Special course for the officials of NIELIT, MeitY - 2016
- Special course for the officials of West Bengal Forest Department – 2015 & 2016
- NCERT-ISRO sponsored certificate course – 2015 & 2016
- ISPRS Summer School – 2015
- Special course for the officials of Indian Air Force – 2015, 2016

## RESEARCH AREAS

- 3D City Modeling and OGC based CityGML & ADEs
- Geospatial data modeling and geo-visualisation
- Spatial data mining
- Distributed GIS/ WebGIS
- Development of Mobile Apps (Android, iOS and Windows)
- Transportation Network Optimization & analysis
- Uncertainty analysis and error propagation
- Spatio-temporal modeling & coupling GIS with process based models
- Health GIS
- Design of Low cost sensors
- Application development and customized solutions using open source tools & technologies

## INFRASTRUCTURE / INSTRUMENTS

### Instruments

- High-sensitivity 48 channel GPS devices

### Hardware/Softwares

- High end work stations and desktops
- ILWIS, ERDAS, ArcGIS, ENVI, QGIS, IGIS, etc.

### Laboratories

- Electronics lab
- Research computer lab for M.Sc & M.Tech students in research phase
- JRF computer laboratory

## PROJECTS

- Development of total turn-key software solution using mobile apps and dashboard for Swachh Bharat Abhiyaan
- Indian Bio-resource Information Network: A distributed portal
- Real Time Road Traffic Monitoring Using WSN
- IGBP-LULC Dynamics Modeling Platform
- Evaluation of GAGAN & IRNSS Data
- LULC classification using Deep Learning
- Mobile & Location Based Services (LBS) Apps
- Multi-Depot Capacitated Vehicle Routing Problem with Time Window
- Effects of Temporal Granularity in Climatic Forcing, Vegetation Index and Gravity Data
- 3D City Modeling for harnessing solar energy to develop solar cities, traffic noise and indoor/outdoor logistics
- QGIS- Lite (Beta)
- Analyzing crowdsourced Wikipedia articles using geotagged data
- Validation of high resolution land surface parameters using space borne gravity anomalies
- Kalman Filter based Position Determination for IRNSS Receiver
- Spatio Temporal data analysis using EOF
- Position estimation using satellite navigation data- A Mathematical Approach
- Similarity Measures in Spatio-temporal Data Mining
- Geostatistical fusion using Cokriging and Regression kriging

## FACULTY AND TECHNICAL STAFF

**Dr. Sameer Saran**, Head and Scientist –SF  
GIS, Web GIS, Spatial Database and Modelling, Data Mining

**Mr. Kapil Oberai**, Scientist/Engineer - SE  
Databases, Web GIS & Location Based Services

**Mr. Shailendra Kumar**, Scientist/Engineer – SE  
Electronics, RF & Microwave

**Mr. Ashutosh Kumar Jha**, Scientist/Engineer - SE  
Cluster Computing & Data Assimilation, LULC Modeling

**Mr. Prasun Kumar Gupta**, Scientist/Engineer – SE  
4D GIS, Programming & Application Development, Open Source GIS and Modeling

**Dr. Ashutosh Srivastava**, Scientist/Engineer - SD  
GNSS, Mathematics, Trend analysis, Orbital dynamics

**Mr. Hari Shankar**, Scientist/Engineer – SD  
Transportation GIS, Traffic Telematics, Spatial Data Quality

**Mr. K.Shiva Reddy**, Scientist/Engineer – SD  
Health GIS, Spatial data mining, Open Source GIS Customization & software development, WebGIS

**Mr. Prabhakar Alok Verma**, Scientist/Engineer - SC  
Geostatistics, programming & optimization

**Mr. Aniruddha A. Deshmukh**, Sr. Scientific Assistant  
GIS & Remote Sensing Applications

**Geoweb services IT & Distance Learning Department (GITDL)** is newly formed department at IIRS by considering the increasing demand of capacity building in Geoweb Services, IT and Distance Learning. The department caters to three areas :

- A. Geoweb Services:** Design and development of Geoweb/Web GIS based solutions for various thematic applications using desktop and mobile platforms;
- B. Information Technology (IT):** Capacity building on advancements in Information Technologies (IT) for Geospatial applications; Cyber GIS and computation intensive spatial analysis and processing; Central data, computing and Information Services; IT Infrastructure development, setup and operations for the Institute.
- C. Distance Learning (DL):** Live & interactive and e-learning.; Digital contents creation for Geospatial technologies; R&D activities on 2D and 3D Simulations and virtualization and methodologies on active learning.

## IIRS OUTREACH PROGRAMME

### Courses Available as e-learning

- Comprehensive certificate course on RS and GIS - 4 Months duration.
- One month fundamental certificate courses on RS, Photogrammetry, GIS, DIP

### Live & interactive Courses - 2018

- Hyperspectral RS and its Applications- Geoinformatics for forest fire management- 3 weeks
- RS&GIS technology for Forest Fire Monitoring- 1 week
- RS & GIS applications in Water Resources- 2 weeks
- Geospatial Modeling for Watershed Management- 1 week
- Advanced Image Analysis- 2 weeks
- Geospatial Modeling and Applications for Urban and Regional Areas- 2 weeks
- Advanced Geospatial Modelling tools and techniques- 2 weeks
- RS and Digital Image Analysis- 4 weeks
- GNSS and GIS- 6 weeks
- Basics of "RS , GIS and GNSS- 13 weeks
- RS in Crop Management / Agro-meteorology – 1 week

Website- <https://elearning.iirs.gov.in>

## RESEARCH & DEVELOPMENT

- System for Weather and Apadaa Management Information for Sri Lanka (SWAMIS educational Dashboard);
- Web-enabled Spectral Library Archival & Analysis System;
- ISRO Digital Knowledge Repository;
- Spatial Biodiversity Model using WPS and Web orchestrations;
- IIRS office digital workflow automation;
- Performance Analysis of Segmentation for feature identification;
- Terrestrial Photogrammetry Applications;
- Space borne LiDAR for LULC Classification and Building Height Estimation.



## INFRASTRUCTURE / INSTRUMENTS

- State-of-art Data Center;
- High speed enterprise level Wi-Fi campus connectivity ;
- High Performance Computing cluster for scientific data analysis and processing;
- Centralized license management of scientific software;
- Centralize Network Storage (SAN/NAS) 100 TB;
- Central Tape Library for data archive;
- Server virtualization platform for student R&D and Institutional requirements;
- Online Web servers, application servers, data servers, DNS, DHCP, Radius server and NMS;
- Enterprise web security system (Firewalls and UTM);
- 10G campus network with high availability core switches, access switches, routers configured in VLAN and DMZ;
- Gigabit Internet Bandwidth from 3 ISPs- NKN, TATA and BSNL.

## FACULTY & TECHNICAL STAFF

- **Dr. Harish Karnatrak**, Head, GIT&DL  
Web based Geoinformatics and Spatial DBMS
- **Dr. Poonam S Tiwari**, Scientist/Engineer -SF  
Photogrammetry and Image Processing
- **Mr. Ravi Bhandari**, Scientist/Engineer- SE  
Computer Network and Cyber Security
- **Mr. Kamal Pandey**, Scientist/Engineer-SD  
Geospatial Application Software Development
- **Mr. Ashok Ghildiyal**, Sr. Technical Assistant - A  
Electronics and Communications
- **Mr. Janardan Vishwakarma**, Sr. Technical Assistant - A  
Electronics and Communications
- **Mr. Manghea Ram**, Sr. Technical Assistant -A  
Web Development and DBMS
- **Mr. Devi Sharan Sharma**, Sr. Draftsman  
Cartography & Data Archive
- **Md. Sajid Ansari**, Technician - D  
Instrumentations



**Head Geoweb Services, IT & Distance Learning  
Department**  
IIRS, ISRO, Department of Space, Govt. of India  
4-Kalidas Road, Dehradun-248001  
Tel No:0135 2524332





**Forestry and Ecology Department (FED)** was established in 1966 with the aim to impart professional training on the utility of aerial photography for forest resources inventory and monitoring for scientific community, in general, and the forest officers in particulars. The programmes and scope of activities of the Department have evolved and enlarged over the years. A brief on department's mandate, activities and achievements is provided here:

## REGULAR COURSES

- **M.Tech.** in RS & GIS with Specialization in Forest Resources & Ecosystem Analysis.
- **P.G. Diploma** in RS & GIS with Specialization in Forest Resources & Ecosystem Analysis.
- **P.G. Diploma** in RS & GIS Applications for CSSTEAP (UN)
- **NNRMS-ISRO Sponsored Certificate Course** for University Faculty.

## SPECIAL COURSES

- One-Week Refresher Training Course for IFS Officers on RS and GIS Applications in Working Plan Preparation - 2015, 2016, 2017.
- Special Course on RS and GIS Applications in Carbon Forestry for the Forest Range Officers from Bangladesh Forest Department - 2015.
- Special Course on Application of RS and GIS in Forestry and Wildlife Research for Research Scholars of Jammu University - 2015
- Special Course on Advanced Course on RS and GIS in Forestry Applications for UPRSAC Project Scientists - 2015
- Special Course on Applications of RS and GIS in Forestry for Forest Range Officers - 2016
- Outreach programme on Applications of RS and GIS in Carbon Forestry - 2017

## RESEARCH AREAS

- Biodiversity Characterization and conservation prioritization.
- Species distribution & Plant invasion risk modelling.
- Synergistic use of advanced sensors (hyperspectral, LiDAR, microwave) for forest biophysical and biochemical parameters retrieval.
- Carbon pool and flux measurement for forest productivity assessment.
- Ecosystem vulnerability assessment.
- Forest fire monitoring & risk prediction.
- Climate change impact on forest ecosystems.
- Wildlife habitat and corridor analysis.
- Ecosystem services assessment

## FACULTY AND SPECIALIZATION

**Dr. Hitendra Padalia, Scientist/Engineer - SF**

Research area: Advanced sensors applications in forestry, Geospatial modeling for natural resource assessment

**Dr. Subrata Nandy, Scientist/Engineer - SE**

Research area: Forest Biomass & Productivity Assessment, LiDAR RS in forestry, Forest Ecology

## PROJECTS

- Vegetation-atmosphere carbon flux modelling
- Assessment of ecosystem processes in North-west Himalaya
- Biodiversity characterisation at community level
- Assessment of forest disturbance and biomass using airborne NISAR data
- AVIRIS-NG studies on forest structure and foliar chemistry
- Evaluation of PolInSAR data for forest biophysical parameters retrieval
- Optimizing parameters from multiple sensors for forest biomass estimation
- Application of space-borne/airborne LiDAR and optical data for studying aboveground forest biomass
- Forest fire risk modelling
- Wildlife habitat modelling and evaluation
- Retrieving forest inventory variables using Terrestrial Laser Scanning (TLS)
- Assessment of hotspots of forest invasive species

## INFRASTRUCTURE / INSTRUMENTS

- Research and practical labs with advance computing facilities
- Field instruments:  
Carbon flux towers at Barkot and Haldwani  
Automatic weather stations  
Accupar LP-80 Ceptometer  
CI-110 Plant Canopy Imager  
Chlorophyll fluorometer  
Chlorophyll content meter  
Laser range finder  
Spherical densiometer  
Hypsometer  
Dendrometer  
Haga altimeter  
Increment borer  
Tree caliper



Ceptometer



Head, Forestry and Ecology Department  
IIRS, ISRO, Department of Space, Govt. of India  
4 Kalidas Road, Dehradun-248001  
Tel No.: 0135-2524170

IIRS provides training and education in broad realm of Marine and Atmospheric sciences which includes coastal geomorphology & processes; coastal dynamics & hazards; sea level rise; salt water intrusion into coastal aquifers; modelling estuarine & coastal processes; satellite oceanography & meteorology; ocean color and primary productivity; air-sea interactions & climate change; atmospheric aerosols; numerical modeling & data assimilation, Indian summer monsoon; extreme rainfall events; atmospheric gases, global & regional transport modeling; air quality monitoring, etc. The department has contributed in different research and operational projects of ISRO/DOS. Owing to the interdisciplinary nature, the specialization would encourage professionals and students from different branches of science and engineering subjects to pursue course work under different training and educational programmes running at this institute.

## REGULAR COURSES

- M.Tech. in RS&GIS with specialization 'Marine and Atmospheric Sciences' (2 years programme).
- P.G Diploma in Natural Resources Management in Marine and Atmospheric Sciences (10 months programme)
- P.G. Diploma in Natural Hazard and Disaster Resource Management
- PG Diploma (9 month) in Advanced RS & GIS for professionals from Asia-Pacific region sponsored by CSSTEAP, UN
- NNRMS short Course (for Univ./college Teachers/Institute)
- Summer school on 'Usefulness of RS & GIS for Environmental Science'

## SPECIAL COURSES

- Intl. short course on 'Geospatial technologies for coastal & marine disaster management & climate change for Asia-Pacific.
- Intl. course on RSGIS applications for coastal hazard mitigation & sustainable development for Pacific countries.
- Short course on Weather Forecasting using Numerical Weather Prediction Models for Asia-Pacific countries.
- Short training course on Atmospheric Remote Sensing for Weather and Climate.
- Summer school on 'Data Assimilation' in collaboration of University of Reading, U.K.
- Special Course on 'Geoinformatics for Meteorology and Climatology Applications.

## RESEARCH AREAS

- Coastal Geomorphology and processes, coastal hazards and their mitigation
- Ocean Color and primary productivity
- Upper-ocean geophysical parameter retrieval, near shore water quality, aerosol optical depth over ocean-atmosphere coupling
- Modeling of coastal dynamics, sea level rise and consequent salt water intrusion into coastal aquifers
- Modeling estuaries and coastal processes
- Indian Summer Monsoon studies, Intra-seasonal oscillations, Active and break spells, etc
- Aerosol radiative parameters & regional Aerosol Radiative Forcing
- Retrieval of Atmospheric parameters
- Regional and global chemistry transport modeling
- Ozone and its precursors: chemistry and transport

## INFRASTRUCTURE/INSTRUMENTS

- Microwave Weather Radar for spectral AOD profile at 10 wavelengths.
- Sunphotometer for spectral AOD profile at 5 wavelengths.
- Aethalometer for BC concentration.
- High Volume Sampler for chemical analysis.
- MFR-7 for solar irradiance.
- Aerosol Spectrometer for aerosol number distribution.
- Atmospheric CO<sub>2</sub> sensor.
- Trace gas analyzers for NO<sub>x</sub>, CO and O<sub>3</sub>.

## PROJECTS

- Aerosol Radiative Forcing over India (ISRO-GBP)
- Study of Air Pollutants over Indian subcontinent: Investigation of source region (ISRO-GBP ATCTM)
- Development of retrieval algorithm for INSAT-3D sounder data (INSAT-3D utilization program)
- Retrieval of EVI from Oceansat-2 (Oceansat-2 project)
- Sea level rise and salt water intrusion in low lying coastal tracts of Gujarat (NAPCC)
- Coastal dynamics study of BoB around Sunderban using Space-borne InSAR and PolSAR data (TDP)
- Understanding and modeling the estuarine and coastal processes of the water around India (TDP)
- Diagnostic study of Indian Summer Monsoon Season using Satellite data (TDP)
- Study of Trace gases over Dehradun: Role of Chemical & dynamical processes on distribution of Ozone & its precursors (TDP)
- Rainfall Retrieval using remotely sensed data and study of extreme rainfall events over North West Himalayas (EOAM)

## FACULTY AND TECHNICAL STAFF

**Dr. Debashis Mitra**, Group Head and Scientist-SG  
Coastal Processes and Land-Ocean interaction

**Dr. Akhil Kumar Mishra**, Scientist-SG  
satellite Oceanography, Ocean-Atmosphere interaction

**Dr. Yogesh Kant**, Scientist-SF  
Land surface processes, Atmospheric Aerosols

**Dr. Shuchita Srivastava**, Scientist-SE  
Atmospheric chemistry and dynamics

**Mrs. Charu Singh**, Scientist- SE  
Atmospheric Physics & dynamics, Satellite Meteorology

**Mrs. Pooja Jindal**, Scientist- SD  
Atmospheric Physics, Ozone retrieval

**Dr. Sanjeev Kumar Singh**, Scientist-SD  
Data assimilation, NWP

**Urban and Regional Studies Department (URSD)**, formerly known as Human Settlement Analysis Group (since its inception in 1983 in collaboration with ITC, The Netherlands) is engaged in capacity building activities for the sustainable development of urban regions. Since 1968, 568 professionals under various on-campus courses and 5183 professionals through outreach programme have been trained in Urban and Regional Studies, namely M.Tech. and P.G. Diploma (IIRS and CSSTEAP) and customized special courses for various Ministries and User Departments such as HUDCO, NCRPB, TCPO, etc. Under NNRMS programme, a large number of University faculty members have been trained in geospatial applications in Urban and Regional Studies.

## REGULAR COURSES

- M.Tech. in RS & GIS: Spec.: URS (IIRS & CSSTEAP)
- P.G. Diploma in URS (IIRS & CSSTEAP)
- 8-week NNRMS Training Programme

## SPECIAL COURSES CONDUCTED

- Geospatial Technologies for Urban Planning (five-week) through IIRS Outreach programme
- Geospatial Technologies for Smart City planning (one-week)
- Remote Sensing and GIS Applications for Urban and Regional Planning for Town and Country Planning Organisation, MoHUPA, Gol, New Delhi (two-week)

## RESEARCH AREAS

- Modeling temporal and spatial dynamics of urban areas
- Urban features extraction using advanced techniques
- Urban green space analysis
- Urban heat island
- Urban hazard risk assessment
- 3D city modeling and visualization
- Property taxation and municipal GIS
- Urban pollution
- Urban climate and micro climate studies
- Urban hydrology and water supply studies
- Planning of energy efficient smart Cities

## INFRASTRUCTURE / INSTRUMENTS

- Handheld Juno SD GPS • GAGAN Receiver
- Digital Sound Level Meter (BEHA)
- Non-Contact Temperature Thermometer
- Graywolf Advance Sense Pro • Casella Dust Detector
- Portable Weather Station • Laser Distance Meter
- Scientific Traceable Humidity/ Thermometer
- Non-contact Temperature Thermometer
- Rangeis Compass with elinometer
- Hemi view Digital system
- Laser Distance Meter S910
- Range Compass • Spiegel Relaskop
- Mobile Mapping Unit

## PROJECTS

### Earth Observation Application Mission

- Modelling Temporal & Spatial Growth of North western Himalayan Cities
- Urban Micro-climatic zoning for Planning of Indian Cities using Geospatial Technologies

### Technology Development Projects

- Development of Methodology for Linking Built Environment and Urban Climate to Identify the Adaptation Strategies
- Solar Rooftop Potential Estimation for Smart City Planning
- Linking Urban Air Quality with Built-form Using Geospatial Techniques
- Urban Canopy Parameters Computation Using 3D Databases: A Comparative Evaluation of Urban Areas in Varied Climate Zones
- Integration of Optical and SAR Data for Land Use/Land Cover Classification
- Automating Features Extraction from Very High Resolution Satellite Images
- Evaluation of High-resolution Stereo Datasets for 3D Modeling of Urban Areas.
- 3D City Modeling using Aerial Laser Terrain Mapper (ALTM-DC) and Airborne LiDAR Data

### In-House Research

- ISRO-NASA AVIRIS-NG Hyperspectral Data Analysis
- Evaluation of PlaneScope sample data for spectral characteristics and use in Urban Studies
- Revitalization of Urban Heritage, Nainital, Uttarakhand
- Automatic Shadow Extraction using VHR Images for Urban Information Extraction
- Urban Water Utilities in Indian Metropolitans
- Urban Flood Modelling
- Development of Multi-parametric Index for Assessment of Urban Green Spaces
- GIS Based Accessibility Analysis of Hierarchical Urban Green Spaces
- Hyperspectral Data Fusion

## FACULTY AND SPECIALISATION

- **Sh. Pramod Kumar**, Group Head, Scientist/Engineer-SG  
Urban flood modeling, water supply and Regional Planning
- **Dr. Sandeep Maithani**, Scientist/Engineer-SF  
Modeling temporal and spatial dynamics of urban areas, Night Time OLS data, Urban Hazard
- **Dr. Vandita Srivastava**, Scientist/Engineer-SF  
Spatial Analysis and Modeling, Information Extraction, Geoinformation Management, High Resolution Image Analysis
- **Ms. Kshama Gupta**, Scientist/Engineer-SF  
LiDAR and High Resolution Satellite Data Analysis, Urban Green Spaces, Urban Micro-Climate
- **Ms. Asfa Siddiqui**, Scientist/Engineer-SD  
Hyperspectral Data Analysis, Solar Energy and Urban Pollution
- **Dr. J.Malleswara Rao**, Scientist/Engineer-SD  
High Resolution Image Synthesis, Interpretation and Analysis



Group Head, Urban and Regional Studies Department  
IIRS, ISRO, Department of Space, Govt. of India  
4-Kalidas Road, Dehradun-248001  
Tel No.: 0135-2524187



**Water Resources Department (WRD)** is involved in the capacity building and research activities on various fields of water resources, since year 1986. The department has gained specialization in the areas of hydrological parameter retrieval using remote sensing, hydrological modeling, snow, glacier studies, impact assessment of climate change in water resources, flood monitoring and damage assessment, irrigation water management and drought assessment, soil erosion, sediment yield modelling and reservoir sedimentation, surface water & ground water hydrology and watershed assessment & management.

## REGULAR COURSES

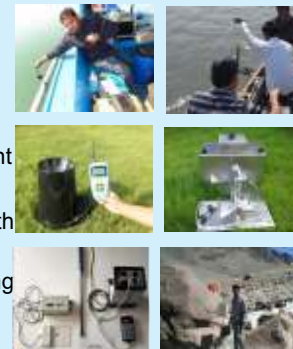
- M. Tech in RS & GIS (Specialization Water Resources)
- Post Graduate Diploma (PGD) in Remote Sensing & GIS (Specialization Water Resources)
- Post Graduate Diploma (PGD) of CSSTEAP in Remote Sensing & GIS (Specialization Water Resources)
- NNRMS-ISRO Sponsored Certificate Courses for Faculty/Scientists/Engineers

## SPECIAL COURSES CONDUCTED

- Special course on Remote Sensing Analysis and Python Programming-2018
- Twenty first IIRS Outreach Programme on Remote Sensing and GIS Applications in Water Resource Management

## LAB INSTRUMENTS :

- Current meter,
- Digital Eco sounder,
- Water Quality kit,
- Portable Soil Moisture
- Salinity Measurement Instrument
- Snow Fork
- Soil Moisture sensors with datalogger
- Tipping bucket type (recording type) Rain gauge
- Automatic weather station



## RESEARCH AREAS

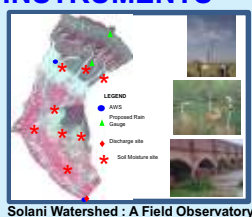
- Hydrological Parameter Retrieval Using Remote Sensing
- Hydrological Modeling
- Climate Change Studies and Impact Assessment on Water Resources
- Hydro-meteorological Data Assimilation in the Hydrological & Weather Forecasting Models.
- Watershed Assessment, Characterization and Management
- Surface and Ground Water Hydrology
- Flood Monitoring, Modeling, Damage and Risk Assessment
- Irrigation Water Management and Drought Assessment
- Snow/Glacier Studies (Snow melt runoff modeling and SAR based snow/ice parameters retrieval)
- Soil Erosion, Sediment Yield Modeling and Reservoir Sedimentation
- Water Distribution System Modeling with RS-GIS

## MAJOR PROJECTS

- Ensemble hydrological modelling approach for integrated water balance studies for dynamic water resources assessment in geospatial environment for Indian River basins.
- Monitoring and Assessment of Ecosystem Processes & Services in North-Western Himalaya: sub theme – 4: water resources status & availability.
- Remote sensing, ground observations and integrated modeling based early warning system for climatic extremes of North West Himalayan region.
- Remote sensing based hydro-meteorological data assimilation in the hydrological and weather forecasting models.
- SARAL ALTIKA applications for Inland Waters, Glaciers and Sunderban Delta..
- Land Use Land Cover dynamics & impact of human dimension in Indian River basins.
- Estimation of snow cover area, snow physical parameters & glacier related studies in parts of Western Himalayas using microwave & optical Remote Sensing.
- Impact of Climate & LULC change on Hydrological Regime of Ganga River Basin.
- Upper and Madhya Ganga canal command infrastructure monitoring.

## INFRASTRUCTURE / INSTRUMENTS

- Field Observatory installed at Haripur, Solani Watershed
- Snow Pack Analyzer installed at Dhundi, Manali; Snow Water Equivalent and Snow Depth Gauge at Kothi, Manali
- Automatic Weather Stations installed at various location of Uttarakhand and Himachal Pradesh.
- Digital Water level recorder installed on Mahanadi River at Petuaghat, West Bengal; Maithon Reservoir; Chhota Sigi and Patsio Glaciers.
- Experimental Hillslope plot for hydrological studies.



Solani Watershed : A Field Observatory



Network of Observation stations in NWH

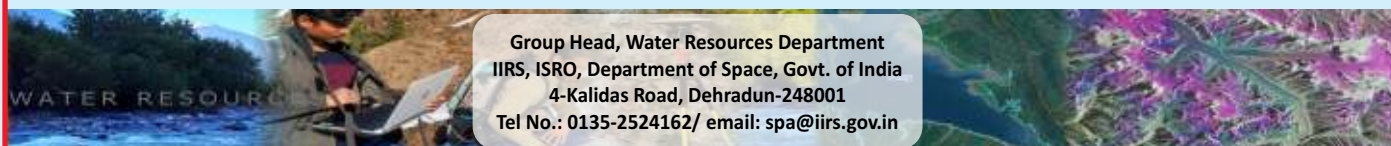


Experimental Hillslope plot

## FACULTY AND SPECIALIZATION

- Dr. S. P. Aggarwal**, Group Head & Scientist/Engineer 'SG'  
Hydrological Modelling, Climate change studies & Watershed management
- Dr. Praveen K. Thakur**, Scientist/Engineer 'SF'  
Snow and Flood hydrology, Microwave Remote Sensing for WR and Data Assimilation
- Dr. Bhaskar R. Nikam**, Scientist/Engineer 'SE'  
Irrigation Water Management, Hydrological Modelling, Soil Erosion Modeling
- Dr. Vaibhav Garg**, Scientist/Engineer 'SE'  
Hyperspectral remote sensing for WR, Surface Water Hydrology, Hydrological Modelling
- Dr. Arpit Chouksey**, Scientist/Engineer 'SD'  
Hill Slope Hydrology and Hydrological Modelling
- Mr. Pankaj Dhote**, Scientist/Engineer 'SD'  
Flood modeling (including GLOF) and Hydrological Modelling

Group Head, Water Resources Department  
IIRS, ISRO, Department of Space, Govt. of India  
4-Kalidas Road, Dehradun-248001  
Tel No.: 0135-2524162/ email: spa@iirs.gov.in



Geosciences and Disaster Management Studies Group (G&DMSG) comprise of Disaster Management Studies Department (DMSD) and Geosciences Department (GSGD) earlier known as Geosciences Division (GSD) is one of the oldest divisions of IIRS established in 1966 to provide professional training to technical staff of organizations dealing with earth sciences applications such as mineral and oil exploration, engineering geological mapping, geological survey and groundwater exploration.

## REGULAR COURSES

- M. Tech in Remote Sensing and GIS (Specialization: Geosciences, in collaboration with Andhra University)
- P.G. Diploma in Remote Sensing and GIS Applications for Natural Resources Management (Specialization: Geosciences)
- P.G. Diploma in Geo-Information Science and Earth Observation with specialization in NHDRM
- PG Diploma in Remote Sensing & GIS Course of CSSTEAP (UN)
- NNRMS course in GIS Technology Applications (for University/Institute/College Teachers)

## SPECIAL COURSES

- Special course on 'Space technology Applications in Disaster Management Support' for Tajikistan Officials
- Applications of Geoinformatics in Geomorphology for GSI
- Earth Observation for Disaster Response, Recovery and Preparedness for Bhutanese Nationals (sponsored by UNDP/CSSTEAP)

## RESEARCH AREAS

- Landslide hazard modelling
- Geodynamics and seismicity of western Himalaya
- Glacier and landform dynamics
- Ground water studies (Space Gravity related)
- Thermal and Microwave Remote Sensing
- Hyperspectral Remote Sensing - Mineral Exploration
- Climate Change induced vulnerabilities
- Dynamic Forest fire risk modelling

## INFRASTRUCTURE / INSTRUMENTATION

### Instruments

- Vibrating wire Piezometer and Extensometer
- GNSS receiver and analyser (4 CORS and 4 CMGI)
- IP and Earth Resistivity meter (40 Channel ERT)
- 48 Channel Engineering Seismograph
- Ground penetrating radar (600/200/100/40/25 MHz)
- Seismic station (2 BBS and 2 SMA)

### Hardware / Software

- Advance computing facility (workstations) and Desktops
- ERDAS Imagine, Leica Photogrammetry Suite, SARSCAPE, ARC GIS, SPSS, Matlab, ENVI, IDL, Trimble Pivot, Leica Spider and RockWorks.

### Laboratories

- Research computer lab for M.Tech and PGD students
- JRF computer laboratory
- Engineering Geology Lab - Direct Shear, Tri-axial rock testing equipment, Schmidt hammer etc.
- Hyperspectral Lab - Visible and SWIR Spectro-radiometer

## PROJECTS

- Geodynamics and Seismicity Investigations in Western Himalaya (EOAM)
  - Deformation measurement and strain modelling using DGPS, DInSAR and ScanSAR.
  - Earthquake precursor studies (*TEC and Seismic*)
  - Active fault mapping using high resolution EO data in selected sectors around MCT and HFT.
- Mapping, Modeling and Impact Assessment of Land Subsidence in Northern India using DInSAR (EOAM).
- Reflectance spectroscopy for mineral exploration in parts of mineral rich belt of Rajasthan and Odisha (EOAM).
- Rainfall Threshold Modelling for initiation of landslides and decoupling of spatial variations in precipitation, erosion, tectonics in Garhwal Himalaya (DMSP); and DInSAR and temporal InSAR based landslide movement detection and modeling (DMSP).
- Thermal anomaly detection and monitoring of coal fire in the Gondwana Coalfields of India using time-series coarse resolution multispectral TIR data & impact analysis (EOAM)
- Risk assessment, simulation/ modelling and characterization of geotechnical properties of vulnerable slopes and landslides in Garhwal Himalaya (TDP).
- Study seasonal variation of Stress and Strain distribution using GNSS and Correlation with Seismic Activity in Northwest Himalaya (TDP).
- Assessment of potential vulnerability of western Himalayan glaciers to climate change (TDP)
- Vulnerability Assessment of Mountain Ecosystem to Climate Change
- Forest Fire Risk Assessment and Modelling

## FACULTY

**Dr. Prashant Kumar Champati ray**, Group Head, G&DMS Group

**Dr. Rajat Subhra Chatterjee**, Head, Geoscience Department

**Dr. Shovan Lal Chatteraj**, Scientist – SE

**Ms. Richa Upadhyay**, Scientist – SD

**Dr. Pratima Pandey**, Scientist – SD

**Mr. Suresh Kannaujiya**, Scientist – SD

**Dr. Arijit Roy**, Head, Disaster Management Studies Department

**Mr. Yateesh Ketholia**, Scientist – SC



Total Station



GPS



CORS Station

Group Head, Geosciences and Disaster Management Studies Group  
Indian Institute of Remote Sensing, ISRO, Department of Space, Government of India, 4, Kalidas Road, Dehradun - 248001, Uttarakhand  
Phone: +91-135-2524153, 2745516, Email: gsd@iirs.gov.in



Spectroradiometer



Computing Lab



Lecture Hall

**Photogrammetry and Remote sensing Department (PRSD)** established in 1966 is one of the oldest departments of the institute imparting professional training in the field of photogrammetry, cartography, remote sensing, and image processing to varied course participants: university teachers, academicians, govt. officials, and freshly graduated students. Initially it started with aerial photogrammetry with a gradual transition to satellite photogrammetry and its applications. The training programmes are regularly updated by incorporating the state of art technology.

## REGULAR COURSES

- M. Tech in RS & GIS
- M.Sc. in Geoinformation Science and Earth Observation (under JEP with ITC, The Netherlands)
- P.G. Diploma in Geoinformation Science and Earth Observations (under JEP with ITC, The Netherlands)
- ITEC/SCAAP courses
- NNRMS Course

## SPECIAL COURSES CONDUCTED

- UAV Remote Sensing & its Application
- Lidar Remote Sensing and its Applications
- Microwave Remote Sensing and its Applications
- Hyperspectral remote Sensing and its Applications

## RESEARCH AREAS

- Satellite Photogrammetry
- Large Scale Mapping using High Resolution data
- Close range Photogrammetry
- Advanced Image Classification and Analysis
- Microwave data processing for feature extraction
- PolSAR studies for modeling and information extraction
- PolSAR Calibration of Quad-pol SAR data
- PolInSAR Tomography for manmade and natural features
- Mapping & Feature Extraction using LiDAR
- Hyperspectral data processing for Land cover Mapping
- Time series Image Analysis
- Atmospheric corrections
- Low altitude platform remote sensing
- Global evaluation of columnar and vertically distributed properties of aerosols using remote sensing techniques

## INFRASTRUCTURE / INSTRUMENTS

### Instruments

- Geodetic GNSS receivers
- Terrestrial Laser Scanner
- Metric Cameras
- Thermal Infrared gun

### Hardware

- High end work stations and desktops
- ERDAS Imagine, ArcGIS, ENVI, Socetset, SARscape, etc.

### Laboratories

- Common computer lab for conducting training
- Research computer lab for M.Sc & M.Tech students in research phase



## PROJECTS

### EOAM

- Precise terrain parameter extraction using low altitude platforms
- Synergetic utilization of earth observation data for automatic retrieval system and monitoring of water, vegetation and built up area of variable scales
- Mapping, Modeling and impact assessment of Land subsidence in Northern India
- GPS & GAGAN/IRNSS data analysis for Intra-Plate Geodynamic Profiling in Active Seismic Zones

### TDP

- Urban feature extraction from multisource satellite data.
- Integration of microwave and optical data for photogrammetric product generation, and change detection mapping
- Development of semi-empirical/numerical models for biophysical characterization of tropical forest using spaceborne PolSAR and InSAR techniques
- Information Extraction using Microwave and hyperspectral data
- Developing a fuzzy similarity system based on image transforms and textures for feature identification
- Aerosol optical depth estimation studies over land using Indian satellite data
- ISRO DOS Projects
- Hybrid polarimetric decomposition modeling of Lunar Surface for scattering information retrieval at S-band wavelength using Chandrayan-1, Mini-SAR Data

### In-house projects

- Close range Photogrammetry for low cost alternative for dense surface modeling and its application

## FACULTY AND SPECIALIZATION

**Mrs. Shefali Agrawal, Group Head, GTOP and Scientist/Engineer -SG**  
Remote Sensing, Image Analysis, Satellite Photogrammetry & LiDAR

**Dr. Anil Kumar, Head, Scientist/Engineer - SG**  
Soft Computing, Digital Photogrammetry, GNSS & LiDAR

**Mrs. Minakshi Kumar, Scientist/Engineer - SF**  
Research area: Digital Image Processing & Feature Extraction

**Mr. Ashutosh Bhardwaj, Scientist/Engineer - SF**  
Photogrammetry, Remote Sensing, GNSS & LiDAR

**Dr. Hina Pande, Scientist/Engineer - SF**  
Photogrammetry, & Automatic Feature Extraction

**Mrs. Manu Mehta, Scientist/Engineer - SE**  
Remote sensing & Aerosol Studies

**Mr. Vinay kumar, Scientist/Engineer - SE**  
Hyperspectral Remote Sensing

**Mr. Shashi kumar, Scientist/Engineer - SE**  
Microwave Remote Sensing, & Geoinformatics

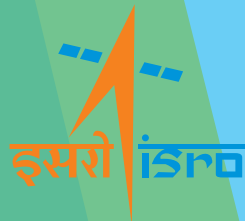
**Mr. Raghavendra Sara, Scientist/Engineer - SD**  
LiDAR, GNSS, & Photogrammetry





**FOR FURTHER DETAILS PLEASE CONTACT:**

**डॉ. प्रकाश चौहान, निदेशक**  
**भारतीय सुदूर संवेदन संस्थान**  
भारतीय अंतरिक्ष अनुसंधान संगठन  
4, कालीदास रोड, देहरादून-248 001  
उत्तराखण्ड, भारत  
[www.iirs.gov.in](http://www.iirs.gov.in)



Dr. Prakash Chauhan, Director  
Indian Institute of Remote Sensing  
Indian Space Research Organisation  
4, Kalidas Road, Dehradun-248001  
Uttarakhand, India  
[www.iirs.gov.in](http://www.iirs.gov.in)

| S. No.                                                                                              | Course Code | Specialization                             | Intermediate/ Pre-University | Essential Qualifications                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------|-------------|--------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>POST-GRADUATE DIPLOMA IN REMOTE SENSING AND GIS WITH SPECIALIZATION IN FOLLOWING DISCIPLINES</b> |             |                                            |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 1.                                                                                                  | D-AS        | Agriculture and Soils                      | Science                      | M.Sc. in Agricultural Sciences (Soil Sci./Agromet./Entomology/Pathology/Agron./Plant Physiol./ Hort./Soil Cons./Watershed Mgmt./ Env.Sc.** (OR) B.E./B.Tech. (Agril. Engg./Agri. Informatics) (OR) 4 years B.Sc. Agriculture (OR) Masters in Geography*                                                                                                                                                                                                |
| 2.                                                                                                  | D-FE        | Forest Resources & Ecosystem Analysis      | Science                      | M.Sc. (Forestry/Ecology/Botany/Wildlife Sci./Biosci./Zoology/Env. Sci.*/Env. Mgmt.**/Natural Resources Management/ Life Sci./ Plant Science) with Biology subjects at Graduation (OR) 4 years B.Sc. (Forestry/Biotech./Forest-Biotech./Bioinformatics) (OR) B.E./B.Tech. (Biotech./Forest. Biotech./Bioinformatics/Environmental Engg.** (OR) Masters in Geography*                                                                                    |
| 3.                                                                                                  | D-GG        | Geosciences                                | Science                      | M.Sc./ M.Sc.(Tech.)/ M.Tech. (Geol./Appl. Geol./Geophy./Earth Sci./Geoexplor./Petrol. Engg./ Geo-Engg./ Mining Engg./Geography*) (OR) B.Tech./B.E. (Civil Engg./Geosci./Petrol. Engg./ Mining Engg./Mineral Processing)                                                                                                                                                                                                                                |
| 4.                                                                                                  | D-MS        | Marine & Atmospheric Sciences              | Science with Maths           | M.Sc. (Marine Sci./Earth Sci./Phy./Oceanog./Meteor./Atm. Sci./Env. Sci.*/Maths) (OR) Masters in Geography with B.Sc. in Phy./Chem./Math/Geology/Env. Sci.*/Marine Biology/Geography*                                                                                                                                                                                                                                                                   |
| 5.                                                                                                  | D-UR        | Urban & Regional Studies                   | Science                      | Master (Plan./Arch./Civil/Comp. Engg. or eq./Geoinformatics or eq./Env.Sc.*) (OR) B.Plan./ B.Arch. (OR) B.E./B.Tech. (Civil/Comp. Engg. or equivalent) (OR) Masters in Geography*                                                                                                                                                                                                                                                                      |
| 6.                                                                                                  | D-WR        | Water Resources                            | Science with Maths           | Master (Geol./Env. Sci.*) (OR) B.E./B.Tech. (Civil Engg./Agril. Engg./Water Resources Engg./ Structural Engg.)                                                                                                                                                                                                                                                                                                                                         |
| 7.                                                                                                  | D-PR        | Photogrammetry & Remote Sensing            | Science with Maths           | M.Sc./M.Tech. (Phy./Appl. Phy./Maths/Chem./Stat./Appl. Maths/Geoinform./Geomatics/Remote Sensing/Civil Engg. or equivalent) (OR) B.E./B.Tech./B.Sc. Engg. (Civil/Electronics/ Electrical/ ECE/ Comp. Sci./ Comp. Engg./ IT/ Geomatics/ Geoinform. / Remote Sensing or equivalent) (OR) M.Sc. Geography*                                                                                                                                                |
| 8.                                                                                                  | D-NHDM      | Natural Hazards & Disaster Risk Management | Science                      | Master* (Disaster Mgmt.**/Natural Resource Mgmt.**/ Env. Mgmt.**/Meteorology) (OR) M.Sc. (Phy./ Maths/Chem./Botany/ Zool./Geol./Earth Sci./Env. Sci.**/Marine Sci./Atm. Sci./Agri./Forestry) (OR) B.Arch./ B.Plan./M.Plan. (OR) B.E./B.Tech. (Civil Engg./Env. Engg./Geosci./Geoexplor./Geo-Engg./Earthquake Engg./ I.T./Comp. Sci.) (OR) B.Sc. (4-year Forestry/ Agri.) (OR) Masters in Geography* (OR) MCA with Science subjects at Graduation level |

1. Each specialisation has 6 seats

2. Start month : August

3. Course fee: Govt. Sponsored = Nil, Self-financed (Indian) = Rs. 60,000.00, Self-financed (Foreign) = \$6,000 USD

\*with graduation in Science

\*\*with graduation in Science or Engineering

### M.TECH. IN RS & GIS WITH SPECIALIZATION IN FOLLOWING DISCIPLINES

|    |      |                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9. | M-RG | <b>Specialization:</b> (i) Agriculture and Soils, (ii) Forest Resources & Ecosystem Analysis, (iii) Geosciences, (iv) Marine & Atmospheric Sciences, (v) Urban & Regional Studies, (vi) Water Resources, (vii) Satellite Image Analysis & Photogrammetry and (viii) Geoinformatics | <ul style="list-style-type: none"> <li>For specializations from Sl. No. 1 to 7: corresponding qualifications as mentioned for Post-Graduate Diploma courses are applicable. Candidate should have Science subjects at graduation level.</li> <li>Entrance Requirement for Geoinformatics Specialization: M.Sc./M.Tech. (Physics/Appl. Physics/Electron./Maths/Appl. Maths/Stat./IT/Comp. Sci./Geo-Engg.) (OR) M.Sc. (Remote Sensing/Geoinform./ Geomatics or its equivalent) (OR) M.Sc. (Geog.)* (OR) MCA* (OR) B.E./B.Tech./B.Sc. (Engg.) (with four year deg. course) in Civil/ ECE/Elect./ Comp. Sci./Comp. Engineering /IT/Remote Sensing/ Geoinform./Agri. Inform./Forest Informatics</li> </ul> |
|----|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

\*with graduation in Science

1. M.Tech. course has 40 seats.

2. Start month : August

3. Course fee: Govt. Sponsored (Rs. 20,000 only towards registration fee of Andhra Univ., no tuition fee), Self-financed (Indian) = Rs. 1,44,000 + Rs. 20,000 (Andhra Univ. Regn. Fee)

Self-financed (Foreign) = USD 14,400 + Rs. 20,000 (Andhra Univ. Regn. Fee)

**Note** (for M.Tech. and PG Diploma Courses):

a. Candidates should have secured a minimum of 55% marks in the qualifying examination.

b. M.Tech. degree is presently accredited by Andhra University, Visakhapatnam (India).

c. Admission for M.Tech. course is based on entrance test (presently held at Bangalore, Kolkata, Dehradun, Jodhpur, Nagpur, Shillong and Thiruvananthapuram), interview and academic record. Govt.-sponsored candidates are exempted from written test and they have to appear only for interview. Other candidates need to appear for Entrance Examination followed by Interview.

d. Admission to P.G. Diploma course is based on merit considering the academic record and subject relevance.

e. Govt. sponsored candidates are given preference and Admission Committee may consider relaxation in qualification.

### IIRS-ITC JOINT EDUCATION PROGRAMME (JEP)

|      |       |                                                                                                            |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------|-------|------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| *10. | D-GI* | Post-Graduate Diploma* in Geoinformation Science & Earth Observation with specialization in Geoinformatics | Science | M.Sc./M.Tech. (Phy./Appl. Phy./ Electron./ Maths/Appl. Maths/ Stat./ IT/ Comp. Sci./ Geology/ Geophysics/ Geo-Engg./ Agriculture/ Forestry/ Env. Sci.), (OR) B.E./B.Tech./B.Sc. (Engg.) (with 4 years deg. course) in Civil/ ECE/ Comp. Sci./ Comp. Engineering/ IT/ Electrical/ Geoinformatics/ Geomatics/ Agri./ Geosci./ Petrol./ Mining/ Agri. Inform./ Agriculture/ Forest Inform./ Forestry or equivalent (OR) B.Arch./ B.Plan./ M.Arch./ M.Plan. (OR) MCA (having B.Sc. in Science subjects) (OR) Master in Geog. (having B.Sc. in science subjects) (OR) Govt. officials having B.Sc. and Science at 10+2 level |
|------|-------|------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

1. Total seats : 10 Nos.

2. Start month: September

3. Course fee: Govt. Sponsored=Euro 450

Self-financed (Indian) = Rs. 65,000 + Euro 450 (ITC Fee), Self-financed (Foreign) = Euro 3000 + Euro 450 (ITC-fee)

**Note:**

a. Post-Graduate Diploma in Geoinformatics (D-GI) is awarded jointly by IIRS and ITC/University of Twente.

b. Admission for PG Diploma Course is based on merit considering the academic record and experience. Government-sponsored candidates are given preference

|     |       |                                                                                            |                                                      |  |
|-----|-------|--------------------------------------------------------------------------------------------|------------------------------------------------------|--|
| 11. | M-GI* | M.Sc* in Geo-information Science & Earth Observation with specialization in Geoinformatics | Entrance requirements as mentioned under Sl. No. 10. |  |
|-----|-------|--------------------------------------------------------------------------------------------|------------------------------------------------------|--|

1. Total seats : 10 Nos.

2. Start month: September

3. Course fee: Govt. Sponsored = Nil Fee to IIRS + ITC Fee# + Others%

Self-financed (Indian) = Rs. 1,20,000 + ITC Fee# + Others%, Self-financed (Foreign) = Euro 5000 (payable to IIRS) + ITC Fee# + Others% #ITC Fee: [Euro 4708 (tuition fee)] Plus Euro 4043 approx. (towards living allowance [Euro 3563], Insurance [Euro 170] & other cost [Euro 310] for 4.5 month stay in The Netherlands) payable to ITC %Others: To and fro air-travel to visit ITC (to be borne by student)

**Note:**

(a) For M.Sc. course, candidate should have secured a minimum of 60% marks in the qualifying examination.

(b) M.Sc. degree is awarded by the University of Twente, The Netherlands under Joint IIRS-ITC Education Program.

(c) The admission for M.Sc. Course is based on entrance test (presently held at Bangalore, Kolkata, Dehradun, Jodhpur, Nagpur, Shillong and Thiruvananthapuram), interview and academic record; government-sponsored candidates are exempted from appearing in the entrance test.

| S. No.                                                                                                                                                                                                                                                                                                                                                                                                                                         | Course Code | Specialization                                                                                          | Intermediate/ Pre-University                                                                                                                                                                                                                                                                                                                                                                         | Essential Qualifications |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>REMOTE SENSING APPLICATIONS: THEME-SPECIFIC ORIENTATION COURSE</b>                                                                                                                                                                                                                                                                                                                                                                          |             |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                      |                          |
| 12.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>O-DM</b> | Remote Sensing-An Overview for Decision Makers (4 days)                                                 | Decision makers in organizations (with 5 yrs. experience in service)                                                                                                                                                                                                                                                                                                                                 |                          |
| 1. <b>Total seats :</b> 15 Nos.<br>2. <b>Duration :</b> June (4 days)<br>3. <b>Course Fee for Individual Candidate - Govt. Sponsored =</b> Rs. 10,000 (includes boarding + lodging charges) <b>Self-financed (Indian) =</b> Rs.10,000 (includes boarding + lodging charges)                                                                                                                                                                    |             |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                      |                          |
| <b>INTERNATIONAL PROGRAMMES (ONLY FOR FOREIGN NATIONALS FROM ITEC/SCAAP PARTNER COUNTRIES)</b>                                                                                                                                                                                                                                                                                                                                                 |             |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                      |                          |
| 13.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>S-RS</b> | Short Course on Remote Sensing with special emphasis on Digital Image Proc. (ITEC-Sponsored) (2 months) | P.G. Deg./ Grad. Deg./ Diploma in Phy./Chem./Maths/Botany/Forestry/Zool./Wildlife Sci./Env. Sci./Life Sci./Agri. Sci./Meteorology (Agro/ Hydro)/Geog. (with B.Sc. at Grad. level) or any other Sci./any discipline of Engg. with sufficient knowledge of Maths/Stat. at high school level/middle level resource managers and professionals from Govt./NGOs/Universities with 2-year work experience. |                          |
| 1. <b>Total seats :</b> 20<br>2. <b>Duration :</b> January - February                                                                                                                                                                                                                                                                                                                                                                          |             |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                      |                          |
| 14.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>S-GI</b> | Short Course on Geoinformatics (ITEC-Sponsored) (2 months)                                              | P.G. Deg./Grad. Deg./Diploma in Phy./Chem./ Maths/Botany/Forestry/Zool/ Wildlife Sci./Env. Sci./Life Sci./Agri. Sci./ Meteorology (Agro/ Hydro), Geog.(with B.Sc. at Grad. level) or any other Sci./ any discipline of Engg. with sufficient knowledge of Maths/ Stat. at high school level/ middle level resource managers and professionals from Govt./NGOs/Universities with 2-year experience.   |                          |
| 1. <b>Total seats :</b> 20 Nos.<br>2. <b>Duration :</b> September - October<br>3. <b>ITEC Course Fee for Individual Candidate - Govt. Sponsored =</b> Rs. 21,000<br><b>Self-financed (Indian) =</b> Rs. 21,000 (12,000- Fee + 9,000 - Regn.)<br>Candidates should Apply through Ministry of External Affairs Govt. of India ( <a href="http://www.itecgoi.in">www.itecgoi.in</a> )                                                             |             |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                      |                          |
| 15.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>C-RS</b> | Short Course on Remote Sensing and Image Interpretation                                                 | Graduate in any discipline                                                                                                                                                                                                                                                                                                                                                                           |                          |
| 1. <b>Total seats :</b> 15 Nos.<br>2. <b>Duration :</b> January - February<br>3. <b>Course Fee - Govt. Sponsored/Self-financed (Indian) =</b> Rs. 20,000 (12,000- Fee + 8,000 - Regn.)<br><b>Note:</b> Govt. sponsored candidates will be given preference                                                                                                                                                                                     |             |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                      |                          |
| <b>NNRMS-ISRO SPONSORED CERTIFICATE COURSES FOR FACULTY/ SCIENTIST*/ENGINEER*</b>                                                                                                                                                                                                                                                                                                                                                              |             |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                      |                          |
| 16.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>N-GI</b> | GIS Technology and Advances                                                                             | P.G. Deg. in Sci./Engg./Geog/MCA                                                                                                                                                                                                                                                                                                                                                                     |                          |
| 17.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>N-WR</b> | RS & GIS in Water Resources                                                                             | P.G. Deg. in Civil/Agri. Engg.                                                                                                                                                                                                                                                                                                                                                                       |                          |
| 18.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>N-FE</b> | RS & GIS in Forestry/ Ecology / Wildlife/ Env. Sciences                                                 | P.G. Deg.in Bot./Ecol./For./Env. Sci./Zool./Wildlife Sci./LifeSci./Biosci.                                                                                                                                                                                                                                                                                                                           |                          |
| 19.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>N-UR</b> | RS & GIS in Urban & Regional Studies                                                                    | P.G. Deg. in Plann./Civil Engg./Arch./Geog./Geoinformatics or equivalent                                                                                                                                                                                                                                                                                                                             |                          |
| 20.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>N-CM</b> | RS & GIS in Cartography and Mapping                                                                     | P.G. Deg. in Sci./ Engg./ Geog.                                                                                                                                                                                                                                                                                                                                                                      |                          |
| 21.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>N-GG</b> | RS & GIS in Geosciences                                                                                 | P.G. Deg. in Geol./Appl. Geol./Geophy./Geog.                                                                                                                                                                                                                                                                                                                                                         |                          |
| 22.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>N-GA</b> | RS & GIS in Soils & Land Use Planning                                                                   | P.G. Deg. in Agri./Geog./Env. Sci./Agric. Engg./Soil Cons.                                                                                                                                                                                                                                                                                                                                           |                          |
| 23.                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>N-CO</b> | RS & GIS in Coastal & Ocean Sciences                                                                    | P.G. Deg.in Marine Sci./Geol./Oceanog./Appl. Geol./Env. Sci.                                                                                                                                                                                                                                                                                                                                         |                          |
| 1. <b>Each discipline has 8 seats</b><br>2. <b>Duration :</b> May-June (8 weeks)<br>3. <b>Course fee for individual candidate % Govt. Sponsored = Nil, Self-financed (Indian) =</b> Rs. 12,000<br>4. Upper age limit 50 years ]<br>5. Age may be relaxed for government sponsored candidates<br><i>* Preference will be given to University/ College Faculty; admissions to Scientists/ Engineers is subject to the availability of seats.</i> |             |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                      |                          |

**Note:** These are regular courses that are offered every year during the same time period with minor modifications, published through website: [www.iirs.gov.in](http://www.iirs.gov.in)

## Important information:

- If the date of course commencement falls on a holiday, course will start from next working day.
- The medium of instructions is English.
- Sponsoring organizations are required to meet all expenses viz., traveling allowance, daily allowance, contingent expenses, medical expenses, etc. for their candidates. However, courses at Sl. Nos. 12, 13, 14 & 15 are paid courses for all including Govt. organizations. In case of NNRMS course, sponsored candidates are paid TA/DA as per ISRO/DOS rules.
- Govt. organizations (Central/State Government Ministries/ Departments or Autonomous Institutions and State and Central Govt.-funded Universities) can nominate only permanent employee.
- Course fee and other expenditure are likely to change as per IIRS and collaborating University's/ Institute's policy.
- Security deposit: Self-financed candidates have to pay security deposit one month prior to the commencement of the course @Rs. 4,000/- in respect of Certificate Courses, @ Rs. 6,000/- in respect of P.G. Diploma Courses, and @ Rs. 10,000/- in respect of M.Sc./M.Tech. courses failing which seats would be offered to the wait-listed candidates. The security deposit will be adjusted in the course fee.
- Boarding and lodging charges at IIRS Hostel are Rs. 4,500 p.m. (approx.). Local candidates will be considered for hostel accommodation, only if available.
- Increase and decrease in number of seats and age/qualification relaxation for government sponsored candidates will be at the discretion of the institute. In the event of number of applications being large, institute may adopt short listing criteria based on merit i.e. academic record, relevant experience, etc. Candidates nominated by the Government organisations will be given preference.

For further details, please contact: Dean (Academics) or Group Head, Program Planning & Evaluation Group, Indian Institute of Remote Sensing, ISRO, 4 Kalidas Road, Dehradun-248001, U.K., India. Tel: +91-135-2524105, 2524106, 2524107, Fax: +91-135-2741987, 2748041; E-mail: [admissions@iirs.gov.in](mailto:admissions@iirs.gov.in). Kindly visit our website-[www.iirs.gov.in](http://www.iirs.gov.in) for details about IIRS and application form download.