Centre for Space Science and Technology Education in Asia and the Pacific

(Affiliated to the United Nations)

ANNOUNCES SHORT TERM COURSE ON

SATELLITE REMOTE SENSING DATA ACQUISITION & PROCESSING

April 20 – May 15, 2026

conducted at

National Remote Sensing Centre

Indian Space Research Organization
Department of Space, Government of India
Balanagar, Hyderabad - 500037 Telangana State
www.nrsc.gov.in

SATELLITE REMOTE SENSING DATA ACQUISITION & PROCESSING

Introduction: Space Science and Technology play a significant role in informed decision-making, improving the quality of today's human life and society. Most noticeable among these are communication, television, telemedicine, satellite navigation, remote sensing data, weather forecasting, disaster mitigation through emergency mapping, etc. All countries, irrespective of rich or poor, have realised the importance of space technology for improving the living conditions of their citizens. Therefore, all countries should have access to space technology and must share the equitable benefits. The global satellite data availability has made it possible for all countries to get benefits. However, a significant precondition to successful space technology applications is the development of essential indigenous capabilities, particularly human resources. A consensus emerged within the international community that if effective assimilation and appropriate application of space technology are to succeed in developing countries, there is a need to direct the efforts towards building capacities in space technology. Towards this, the United Nations General Assembly called for establishing Regional Centres for Space Science and Technology Education at the regional level in developing countries. Under the auspices of the United Nations, through its Office for Outer Space Affairs (UN-OOSA), the six regional Centres established are Asia and the Pacific (India), Latin America and the Caribbean (Brazil and Mexico), Africa (Morocco and Nigeria), West Asia (Jordan) and Regional Centre for Space Science & Technology in Asia and the Pacific (China)—all these centres affiliate with the United Nations through UN-OOSA.

About CSSTEAP: The Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP) was established in India in November 1995, having its headquarters at Dehradun. It is considered the Centre of Excellence by UN-OOSA. The Indian Institute of Remote Sensing (IIRS), Dehradun, India, a unit of the Indian Space Research Organization (ISRO), Government of India, is the first campus of this Centre. The Centre has been imparting training and education, helping participants in developing research skills through its Master's Degree, Post Graduate and Certificate programmes. The training includes rigorous classroom (theory and hands-on exercises), group discussions, field campaigns and space science and technology pilot projects. These programmes aim to build capacity for participating countries, designing and implementing space-based research information and application programmes. The National Remote Sensing Centre (NRSC), a subsidiary of ISRO has been hosting short courses on Remote Sensing Data Acquisition and Data Processing since August 2023, and Satellite Remote Sensing for Ocean Applications since 2024. In 2025, we are organising a new course on Optical and Microwave Remote Sensing for Mineral, Oil, & Groundwater Exploration.

About Host Institute: National Remote Sensing Centre (NRSC), ISRO, is a centre of eminence that provides remote sensing data acquisition, data processing and geospatial application services to meet national goals and objectives. It has the mandate for establishing ground stations to receive satellite data, generation of data products, dissemination to the users, development of techniques for remote sensing applications, disaster management support, geospatial services for good governance and capacity building for professionals, faculty and students. NRSC is at the forefront of using geospatial information technologies and is collaborating with its stakeholders to build a thriving innovation ecosystem in the Geospatial Technology arena. NRSC designed and developed an S/X band dual polarisation, S/X/Ka triband autotracking 7.5M antenna system to meet the current and future Earth Observation mission requirements. NRSC can establish antenna systems for Indian and foreign users to receive remote sensing satellite data in the S/X/Ka band, subject to the approval of the Department of Space (DOS). NRSC is the nodal Centre for Data processing and hosting Satellite Data Products from IRS satellites right from the first IRS optical mission, namely IRS-1A and SAR imaging missions.

NRSC has expertise in various thematic areas of remote sensing applications, earth and climate science areas. Government agencies, Industries, and Academia immensely benefit from the valuable archive of huge data products, remote sensing science & technology applications, and services NRSC provides. These services, in turn, help the above agencies, and the public in general to meet their respective end goals and objectives.

About the Course: The Course on Satellite Remote Sensing Data Acquisition & Processing shall be for one month duration starting from April 20 - May 15, 2026. The syllabus covers the basics concepts on the basics concepts on data acquisition including design of antennas, baseband systems, hardware and operations of a ground receiving systems, data processing including image processing, georeferencing, ortho rectification for both optical and microwave remote sensing data of various resolutions. Also, topics on multi sensor data fusion, data quality evaluation and advance image processing concepts that involve AI & ML shall be covered in the course. This course includes theory, principles and practice sessions on ground receive system chain and its maintenance, data processing and utilization of geospatial technologies. There shall be study tour, lab visits and hands-on sessions. There shall be a performance evaluation at the end of the course by internal and external faculty for both theory and practical.

Faculty: The core faculty includes senior scientists from NRSC, eminent university professors, and other notable researchers from premier agencies in India and abroad. The faculty has rich experience in developing, installing and operating ground-receiving antennas. Also, they have a strong research-backed scientific background with publications and experience participating in international scientific programmes. A few visiting international experts may deliver lectures on advanced and specialised topics.

Medium of Instruction: The medium of instruction shall be in English. Candidates who are not proficient in English are advised not to apply. Applicants who have done their higher studies in a medium (language) other than English are required to submit a TOEFL score or a diploma/certificate of English language issued by an accredited language institution or by the local UNDP for satisfactory establishment of the applicant's competence in spoken and written English language. Preference will be given to those who secure high scores in the TOEFL examination. Nominating agencies are requested to ensure this.

Course Objectives: To promote awareness and disseminate technical know-how on remote sensing data processing for optical and microwave sensors, data quality evaluation and other advanced image processing techniques that involve AI& ML.

Target Audience: This course is designed for professionals from Central / State Govt./Universities / State Departments /Private Industry / Organizations/Startups engaged in the use of Space Platforms, Remote Sensing & Geospatial technology implementations for Societal Applications.

Course Fee and Accommodation: A course fee of USD $ 300 (equivalent INR for Indian participants) is applicable which includes course materials and field trips. Accommodation for the participants will be arranged in the hostel at NRSC, Shadnagar, Hyderabad. In addition, the participants will have to pay Rs. 120 per day towards accommodation charges + electricity charges. To encourage participation from the Asia-Pacific region, the course fee and the field trip expenses for selected participants are waived.

The course fee may be sent through online transfer/NEFT/RTGS/SWIFT in favour of CSSTEAP, payable at Dehradun with the following bank details:

Banking Institution	:	Punjab National Bank
Account Name	:	Centre for Space Science and Technology Education in Asia and the Pacific
Account Number	:	0111032100000236
SWIFT	:	PUNBINBBDPR
IFSC Code	:	PUNB0445600
Address Bank	:	Survey of India Branch, New Cantt. Road, Dehradun, India

Fellowship to Participants: The candidates are expected to make their own arrangements to meet all expenses. Preference in admission will be given to the candidates who are financially supported by their organisations. A few fellowships covering to and fro international air travel, domestic travel in India and living expenses (INR 15,500 for two weeks) in India are available from the Government of India. However, first preference will be given to the fully self-sponsored candidates and then to the candidates whose sponsoring organisation will be bearing international to and fro travel.

Insurance: Medical, life and disability insurance should be undertaken before leaving their country for India by the participants themselves or on their behalf by their sponsoring institute/organisation to cover entire health and disability risks. No medical expenses will be borne by the Centre. Candidates in sound physical and mental health only need to apply.

Medical fitness certificate from the Authorized Government medical officer covering the status of Eye, Chest (Tuberculosis), Vaccinations, heart, lungs, liver, spleen, Hydrocele, skin & V.D., Hepatitis, HIV, Yellow fever and other contagious diseases be enclosed with the application form. In case if any information requiring medical attention is hidden and is found factually incoherent during the course, the Centre will be obliged to send the candidate back to their home country any time. The travel cost shall be borne either the nominating/sponsoring authority or by the candidates themself.

Eligibility and Selection procedure: The candidates should have a Master's or Bachelor's degree in Electronics, Communications, Computer Science, and Information Technology in Engineering or equivalent qualification relevant in the field of study with at least 5 years of experience in teaching/research or professional experience in the field. The applications are accepted through online mode at https://cssteapun.org/ or https://admissions.cssteapun.org/login

Please fill up the ONLINE APPLICATION FORM available at the CSSTEAP website https://www.cssteapun.org/governing-board). Offline applications will not be considered. Kindly follow the instructions on the website for filling up the form.

Note: Candidate is required to upload a sponsoring/nominating agency certificate with an official seal, and or forwarded by Governing Board member of CSSTEAP in your country (for a list of Governing Board members please refer www.cssteapun.org) to the Indian Mission/High Commission in your respective country or through your country's Embassy/High Commission in New Delhi, India for further processing.

The application should be completed in all respects and accompanied by attested and/or certified copies of all the certificates (School, Bachelor and Master, TOEFL, English Proficiency, etc.). Wherever these certificates are issued in a language other than English, then the same must be translated into English and certified by the Head of the organisation Department or provide English transcription of all such documents.

Syllabus overview

Introduction: Overview of Ground Station, RF Systems, Data Receive Chain, Antenna Control Servo & Mechanical Systems, Data Ingest Hardware & Real Time Systems.

RF Systems: Antenna & Feed Systems , RF tracking, Link Analysis, Performance Evaluation, Noise Survey, Test methodologies, Modulation & Demodulation Schemes

Baseband Systems: Demodulator Design, Performance Evaluation of Receive Chain, Characterisation of IF, BER Performance Evaluation

Servo Systems: Concepts, Types of antenna mounts, Configuration, Design, development & performance evaluation of ACSS

Mechanical Systems: Structural design, Operation, management and maintenance of Mechanical CAD & Workshop facility Operation, management and maintenance of Bore sight lift, antenna & Bucket Lift vehicles

Automation Systems: Overview , Resource allocation, Monitoring & Control, ACCS Functions, Antenna Pointing Error model, Station Control Computer – Relevance in Ground Station Operation

Hardware Development: Overview CPLDs & FPGAs, HDLs, EDA tools, System, Interfaces, Data Ingest Hardware, Serializer/ Test Pattern Generator, Data Encoding/ Decoding Techniques, PCB Design Techniques, QA tests

Real time Data Archival System: Overview Level-0 Product Workflows, Data pre-processing concepts, Design aspects of Data switching matrix, Timing Systems & its applications in Ground segment, Embedded systems - Modelling, synthesis, verification techniques, Implementation of Web based tools for Ground segment operations management

Remote Sensing Data Basics: Optical Image Data processing, Level '0' Data processing, Radiometric Corrections, Geometric corrections, Image Restoration techniques -- Image Noise and noise removal, Image Enhancements, Multisensor Image Fusion techniques, Image Segmentation

Principle of Microwave Remote Sensing: SAR Data Processing, SAR Calibration and Validation, Present and Future SAR missions- An Overview, SAR Polarimetry, Scope of AIML in SAR Data exploitation, IMGEOS Microwave Cal-Val Site visit

Data Quality Evaluation: Quality Standards, Image Quality Assessment, Factors influencing On orbit Platform stability Characterisation of On Orbit sensor response, Calibration aspects / methodologies, Interoperability and time series data, Data Harmonisation, High resolution Imagery

Advance Image processing: Data dissemination portals, Concepts in Geospatial data, Heterogeneous Hardware accelerating technologies, GPGPU & DSP architecture, Machine Learning and Deep learning, Supervised and Unsupervised learning, Regression and Classification, Types of Deep learning architectures Case studies using Deep learning networks

Design Thinking for Innovation : Foundations of Design thinking, Empathy - User Research, Creative Ideation-Brainstorming, Visual & Association tools, Prototyping – storyboards, physical modeling, Testing

Study Tours, Field Visits,
Seminar Presentation,
End Examination

CONTACT DETAIL

For any course related query, the applicants may contact:

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Ph: +91-40- 23884352)

IMPORTANT DATES
Application deadline : March 10, 2026
Information of selection : March 23, 2026
Commencement of Course : April 20, 2026
Completion of Course : May 15, 2026

National Remote Sensing Centre
Indian Space Research Organisation
Dept. of Space, Govt. of India
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