Centre for Space Science and Technology Educa6on in Asia and the Pacific (Affiliated to the United Nations)

ANNOUNCES SHORT TERM COURSE ON

SATELLITE REMOTE SENSING FOR MINERAL, OIL AND GROUND WATER EXPLORATION

30th November - 11th December, 2026.

at

National Remote Sensing Centre

Indian Space Research Organisation
Department of Space, Government of India
Hyderabad - 500037 Telangana

www.nrsc.gov.in

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 realized 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 Organisation (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 organizing a new course on Optical and Microwave Remote Sensing for Mineral, Oil, & Groundwater Exploration.

About the 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 auto-tracking 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 Short Course on Optical & Microwave Remote Sensing for Mineral, Oil and Ground Water Exploration shall be two weeks from NOVEMBER 09-20, 2026. The syllabus covers the basics concepts of ground water prospecting, mineral & oil studies, including some geophysical based analytical studies The course has extensive hands - on exercises that help preparation of groundwater quality database, site-suitability studies and using various instruments such as spectro-radiometer, geo-statistics & GIS based techniques. This course includes theory, principles and practical aspects of the subject. There shall be study tour, lab visits, Field demonstrations of relevant instrumentation for ground water and mineral exploration, 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 comprises senior scientists from NRSC, eminent university professors, and distinguished researchers from premier institutions in India and abroad. They bring extensive experience and domain expertise in groundwater, mineral, and oil exploration using Earth Observation (EO) datasets and field-based observations. Their strong research-oriented scientific background is supported by scholarly publications and participation in national and international scientific programmes. In addition, select international experts may be invited to deliver lectures on advanced and specialized 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 Industries/ Organisations /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. 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:	Survey of India Branch, New Cani. 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. To encourage participation from the Asia-Pacific region, the course fee and the field trip expenses for selected participants are waived.

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 condition 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 by 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, Physics, Geosciences, Remote Sensing & GIS Communications, Computer Science, and Information Technology in Engineering/Sciences 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

Basics of Groundwater

- Introduction to remote sensing GIS for groundwater studies
- Overview of Groundwater Prospects, Exploration, Sustainability Aquifer Storage Recovery: Indian Scenario
- Groundwater scenario in SE Asian countries
- Hands-on Demonstration of Groundwater Prospect mapping

Groundwater Prospecting in Various Hydro-Geological Environment

- Demonstration of Bhuvan-Bhujal & Urban Water Information System (UWIS)
- Case studies on groundwater prospecting in different hydro-geomorphic terrains of India: Potential & Challenges
- Groundwater Quality mapping
- Hand-on tutorial on groundwater quality database preparation using geo-statistics & GIS applications

Groundwater Resource Assessment & Sustainability

- Impact assessment due to groundwater overdraft
- AI –ML techniques for groundwater prospecting
- Hands-on tutorial/ demonstration for site suitability for artificial recharge structures for sustainability management

Present & Future Trend of Groundwater Development & Sustainability: Potential & Challenges

- Role of ground-based observation/instruments for groundwater development & integration with EO datasets
- Groundwater budgeting
- Demonstration on Groundwater Modelling

Hydro-geological fieldwork in NRSC, Shadhnagar campus

- using Electrical Resistivity, GPR and AWLR) for groundwater sustainability planning of the campus
- Presentation by the participants

- Feedback Session

Role Of Remote Sensing & GIS For Mineral & Oil Exploration: An Overview

- Active (Microwave) & Passive (optical, thermal &hyper-spectral remote sensing for mineral & oil exploration- case studies
- Present and future trends of remote sensing based mineral & oil exploration
- Hands-on tutorial on thermal & hyperspectral data processing for mineral exploration
- Hands-on tutorial on microwave datasets for oil exploration

EO Based Impact Assessment on Mineral & Oil Exploration (Coal Fire, Acid Mine Drainage Subsidence, Oil Spill)

- Hands on demonstration on microwave interferometry processing on land subsidence due to mineral-oil exploration
- Hands-on tutorial on oil-spill detection using microwave remote sensing

Geophysical Remote Sensing Analysis for Mineral & Oil Exploration

- Satellite and ground-based gravity and magnetic data processing for mineral exploration
- Demonstration of field instrumentation (Spectro-radiometer, magnetometer).

Contact Details: For any course related query, the applicants may contact:

Dr. Stutee Gupta
Program Coordinator, NRSC UNCSSTEAP Programme Office
Email: cssteap_tc@nrsc.gov.in, cssteap.pmo@gmail.com
Ph: +91-40-23884561

IMPORTANT DATES
Application deadline: September 15, 2026
Information of selection: September 25, 2026
Commencement of Course: November 30, 2026
Completion of Course: December 11, 2026

National Remote Sensing Centre

Indian Space Research Organisation
Dept. of Space, Govt. of India Hyderabad - 500 037 www.nrsc.gov.in
Contact us: cssteap_tc@nrsc.gov.in