CENTRE FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION IN ASIA AND THE PACIFIC

(AFFILIATED TO THE UNITED NATIONS)

ANNOUNCES

SHORT TERM COURSE
ON
REMOTE SENSING DATA ACQUISITION

AUGUST 21- SEPTEMBER 01, 2023

CONDUCTED AT

NATIONAL REMOTE SENSING CENTRE (NRSC)
INDIAN SPACE RESEARCH ORGANIZATION (ISRO)
Department of Space, Government of India
Balanagar, Hyderabad - 500037
Telangana State
www.nrsc.gov.in

Introduction

Space Science and Technology plays a very important role in improving the quality of life of today's human society for information and decision making. 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 major precondition to successful space technology applications in 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 the developing countries, efforts must be made at different levels for capacity building in space technology. Towards this, the United Nations General Assembly called for the establishment of Regional Centres for Space Science and Technology Education at the regional level in the 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 the Centres are affiliated to 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 with its headquarters in Dehradun and is considered as the Centre of Excellence by UN-OOSA. The 1st campus of the centre was established in Dehradun, India at Indian Institute of Remote Sensing (IIRS) which is a unit of Indian Space Research Organization (ISRO), Government of India. The Centre has been imparting training and education, helping participants in developing research skills through its Master Degree, Post Graduate and Certificate programmes. This is achieved through rigorous class-room (theory and hands on exercises), group discussions, field campaigns and pilot projects in the field of space science and technology. These programmes aim at capacity building for participating countries, in designing and implementing space-based research information and application programmes. The National Remote Sensing Centre (NRSC) a subsidiary of ISRO is now hosting short courses on Remote Sensing Data Acquisition and Data processing.

About Host Institute

National Remote Sensing Centre (NRSC), ISRO, is a centre of eminence providing remote sensing data acquisition, data processing and geospatial application services to meet the national goals and objectives. It has the mandate for establishment of ground stations for receiving satellite data, generation of data products, dissemination to the users, and development of techniques for remote sensing applications including disaster management support, geospatial services for good governance and capacity building for professionals, faculty and students. NRSC is in the forefront of using geospatial information technologies and is collaborating with its stakeholders for building a thriving innovation ecosystem in the Geospatial Technology arena. NRSC

designed and developed an S/X band dual polarization 7.5M antenna system to meet the current and future Earth Observation mission requirements. NRSC can establish antenna systems for receiving remote sensing satellite data at S and X band for Indian and foreign users subject to approval of Department of Space (DOS). NRSC is the nodal centre for Data processing and hosting Satellite Data Products from more than 13 IRS satellites right from the first IRS optical mission namely IRS-1A and SAR imaging missions. The Government agencies, industries and academia are highly benefiting and meeting their respective end objectives from valuable huge data products archive, remote sensing science, technology, applications and services provided by NRSC.

About the Course

The Short Course on Remote Sensing Data Acquisition shall be for 15 days starting from Aug 21, 2023 to Sep 1, 2023. The syllabus covers the basics concepts on data acquisition including design of antennas, baseband systems, hardware and operations of a ground receiving systems. It includes theory, principles and practice on ground receive system chain and its maintenance. There shall be study tour, lab visits and hands-on sessions. There shall be performance evaluation at the end of the course by internal and external faculty for both theory and practical.

Faculty

The core faculty is drawn from NRSC, universities and premier agencies from India and abroad. The faculty has rich experience in development, installation and operations of ground receiving antennas. Also, they have strong research backed scientific background with publications, experience of participating in international scientific programmes to their credit. A few visiting international experts shall be invited to deliver lectures on advance and specialized topics.

Medium of Instruction

The medium of instructions shall be in English. The 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 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 score in TOEFL examination. Nominating agencies are requested to ensure this.

Course Objectives

To promote awareness and disseminate technical knowhow on ground receive antennas, baseband systems and other remote sensing ground receive hardware.

Target Participants

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 participant) is applicable which includes course materials and field trips. Accommodation for the participants will be arranged in hostel at NRSC, Shadnagar, Hyderabad. In addition, the participants will have to pay Rs. 120 per day towards accommodation charges + electricity charges. To encourage the participants from the Asia-Pacific region, selected participants will be waived-off the course fee and field trips. 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 for all expenses. Preference in admission will be given to the candidates who are financially supported by their organizations. 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 Government of India. However, first preference will be given to the fully self-sponsored candidates and then to the candidates whose sponsoring organization 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/organization for covering 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 Authorized Government medical officer covering 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 applicationform. In case if any information requiring medical attentionis hidden and if found during the course, the Centre will be obliged to send the candidate back to their home country any time. The travel cost will be borne either the nominating/sponsoring authority or by the candidates themselves.

Eligibility and How to apply

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 www.cssteap.org or https://admissions.cssteap.org/login.

Please fill up the **ONLINE APPLICATION FORM** available at CSSTEAP website www.cssteap.org. **Offline applications will not be considered. Kindly follow the instructions on the website for filling up the form.**

Note: Candidate is required to upload sponsoring/nominating agency certificate with official seal and signature, and or get it forwarded by Governing Board member of CSSTEAP in your country (for list of Governing Board member please refer https://www.cssteap.org/governing-board) 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 completed form alongwith all the attachments is to be sent either 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 Embassy/HC will forward your application to the Course Director of the applied course. Indian applicants need not to send through GB member and Mission**.**

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, if these certificates are issued in a language other than English, then the same must be translated in English and certified by the Head of the organization Department or provide English transcription of all such documents.

IMPORTANT DATES
Last date for receipt of applications: June 30, 2023
Information of selection   : July 17, 2023
Commencement of course   : Aug 21, 2023
Completion of Course   : Sep 01, 2023

CONTACT DETAIL

For any course related query, the applicants may contact:

Dr. M Naresh Kumar

Head HRD/PPEG, Programme Coordinator

(Email: cssteap_tc@nrsc.gov.in **Ph: +91-40- 23884352)**

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 SYSTEMS
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

Study Tour
Field Visits
Seminar Presentation
End Examination

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