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

ANNOUNCES
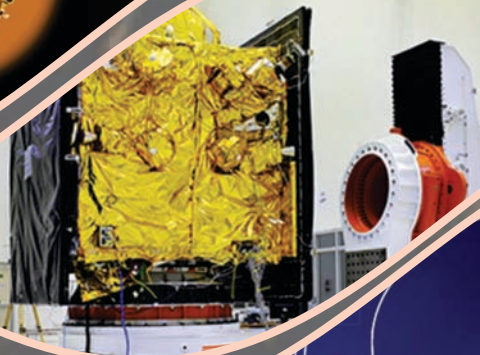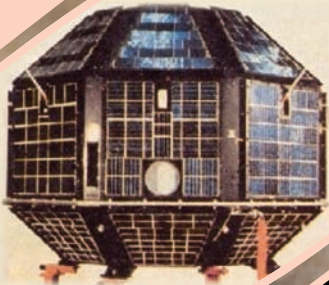
TENTH POST GRADUATE COURSE
in
SATELLITE COMMUNICATIONS

ACADEMIC YEAR 2015 - 2016
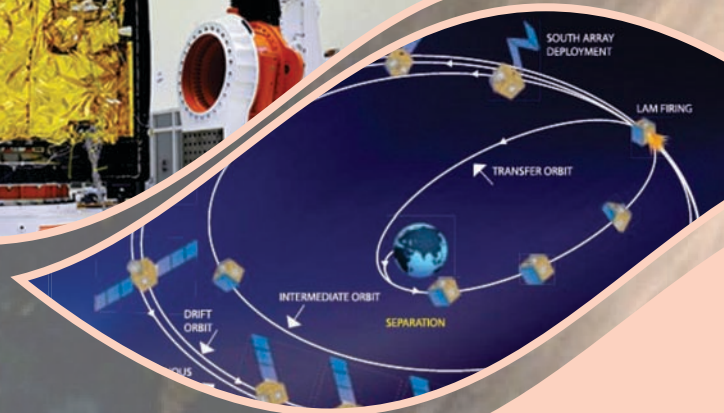
Conducted at

Space Applications Centre
Indian Space Research Organisation
Ahmedabad, India
www.sac.gov.in

Centre for Space Science and Technology
Education in Asia and the Pacific
(Affiliated to the United Nations)
IIRS Campus, 4, Kalidas Road, Dehradun 248 001 India
www.cssteap.org

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For further details please visit website (www.cssteap.org)

CONTENTS

INTRODUCTION

In modern era, the space technology has become indispensable in every sphere of life. Travel, agriculture, industry, commerce, sports, natural resources management and many other fields use extensively space technology. The benefits of space technology, both direct and indirect, have introduced new dimensions in to the study and understanding of Earth's processes and in improving the quality of life for the people living on it. All countries should have access to space technology and must share the benefits. An essential pre-requisite to partaking in these opportunities is the building of various indigenous capacities for the development and utilization of space science and technology. In recognition of such a pre-requisite, a consensus has emerged within the international community that if effective assimilation and appropriate application of space technology are to succeed in the developing countries, devoted efforts must be made for capacity building at the local level, for the development of necessary high-level knowledge and expertise in space technology fields. Towards this end, the United Nations General Assembly had called for the establishment of Centres of 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 (UNOOSA), six regional Centres are established on the basis of regions that correspond to the United Nations Economic Commissions: Asia and the Pacific (India), Latin America and the Caribbean (Brazil and Mexico) Africa (Morocco, Nigeria) and Western Asia (Jordan). All of these Centres are affiliated to the United Nations through UNOOSA. These Centres use existing facilities and expertise already available in education and other research institutions in their respective regions.

ABOUT REGIONAL CENTRE FOR ASIA AND THE PACIFIC IN INDIA

The Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP), affiliated to UN, was established in India in November, 1995. The Centre's Head Quarters is established in Dehradun, India around the infrastructure available at the Indian Institution of

Remote Sensing (IIRS), Indian Space Research Organisation (ISRO), Government of India, Dehradun. For conducting its programmes, the Centre has arrangements with ISRO which has its campus at Space Applications Centre, Ahmedabad and playing as host institution for programmes related to Satellite Communications and Satellite Meteorology and Global Climate and at Physical Research Laboratory in Ahmedabad for Space and Atmospheric Sciences and at IIRS Dehradun for Remote Sensing and GIS.

GOALS OF THE CENTRE

The Centre is an education and research institution, capable of high attainments in the development and transmission of knowledge in the fields of space science and technology. The Centre offers best possible education, research and application experience to its participants in all its programmes. The principal goal of the Centre is to develop skills and knowledge of university educators and researchers, engineers and application scientists, through rigorous theory, research, applications, field exercises and pilot-projects in those aspects of space science and technology that can enhance social and economic development in each country. The programmes aim at development of indigenous capability of participating countries, in designing and implementing space-based research and applications programmes. The Centre will also foster continuing education programmes for its graduates and awareness programmes for policy and decision-makers and the general public.

It should be emphasized that the overall mission of the centres is to assist participating countries in developing and enhancing the knowledge and skills of their citizens in relevant aspects of space science and technology in order that such individuals can effectively contribute to national development programmes.

AFFILIATION TO THE UNITED NATIONS

The Centre has entered into a cooperative agreement with the United Nations which states that the United Nations will cooperate with the Centre by providing expert advice, educational curricula, technical support, necessary documentation and other appropriate support.

EDUCATIONAL PROGRAMME AND COURSES

The educational programmes of the centre are oriented towards the dissemination of knowledge in relevant aspects of space science and technology. The initial emphasis of the centre is to concentrate on in-depth education, research & applications programmes, and linkages to the global programmes/databases, execution of pilot projects, continuing education and awareness and appraisal programmes. Scholars and professionals, who contribute to the educational programme are renowned experts in their respective fields from both within and outside the region.

The details of the educational modules have been finalized based on the curriculum developed under the auspices of the UN Office for Outer Space Affairs and the guidelines emerging from the meetings held for Education Curriculum development for the centre at Granada, Spain in February/March, 1995. These curricula are reviewed by an international Advisory Committee of CSSTEAP from time to time and ratified by UNOOSA.The activities of the Centre are guided by an International Governing Board, International Academic Advisory Committee and Board of Studies.

ACADEMIC ACTIVITIES

The academic activity is divided into two phases. Phase-I is of 9 months duration and executed at the Centre in India. After successful completion of the Phase-I the participants are encouraged to take up Phase-II research project of one year duration in their home country. Phase-II allows participants to take up research project relevant to their home country or organization and apply the technologies. Centre also offers fellowships to the meritorious candidates to do research in Phase II in India

The Centre offers Post Graduate level courses in the fields of:

- Remote Sensing and Geographic Information System (RS and GIS) organized every year
- Satellite Communications (SATCOM) organized every odd year
- Satellite Meteorology and Global Climate (SATMET) organized every even year

- Space and Atmospheric Sciences (SAS) organized every even year
- Global Navigation Satellite System (GNSS) every odd year (proposed from 2015)

Besides post graduate level courses, the Centre also conducts short courses/workshops on the above subjects on specific themes of space science and technology.

The Post Graduate courses are organised in two phases:

Phase - I (9 Months, in India)

- **Core Modules,** where the emphasis is on the development and enhancement of the knowledge and skills of university educators, researchers, engineers and application scientists.

- **Pilot-Project,** oriented towards planning and executing project which provides an opportunity to fine-tune the skills for executing theme-based study.

Phase - II (1 Year, in home country)

- **Research Project** for scholars to conduct and execute projects in their respective country with a view to transfer the technology in his/her organization. It will also be a test of the methodology and knowledge assimilated during Phase-I at the centre.

- Few meritorious students are awarded five months to one year fellowship as per the desire, aptitudes of candidates & selection by CSSTEAP to complete their one year research work at CSSTEAP host institutions in India and avail the opportunity to submit to Andhra University, Visakhapatnam for award of M.Tech degree (Master's degree).

COURSE RECOGNITION BY ANDHRA UNIVERSITY

CSSTEAP has arrangement with Andhra University (Estd. 1926) Vishakhapatnam, India for awarding Master's (M.Tech) Degree subject to the eligibility criteria of the Andhra University. After successfully completing the 9-months P.G. Diploma course candidate should complete one year project work successfully for award of Master of Technology Degree (M.Tech. Degree). The terms and conditions of this arrangement are subject to review from time to time by the Andhra University.

PROGRAMMES ORGANISED

The Centre has so far conducted 18 Post Graduate Courses in Remote Sensing and Geographic Information System. 9 Post Graduate Courses in Satellite Communication, 8 Post Graduate Courses in Satellite Meteorology and Global Climate, and 8 Post Graduate Courses in Space and Atmospherics Sciences. The centre also conducts various short Courses/Workshops from its inception. These educational programmes have benefited more than 1400 scholars from 34 countries in the region. Nineteenth RS & GIS PG course at IIRS Dehradun, 9th SATMET PG Course at SAC, Ahmedabad and 9th Space and Atmospherics Sciences (SAS) PG course at PRL, Ahmedabad are in progress.

ANNOUNCEMENT OF TENTH POST GRADUATE COURSE IN SATELLITE COMMUNICATIONS

Duration : 9 Months – from August 1, 2015 to April 30, 2016.

Venue : Space Applications Centre
Indian Space Research Organisation
Department of Space, Govt. of India
Ahmedabad-380 015, India.

No. of Participants : 15 (Fifteen)

Last date for receipt of applications: March 31, 2015

IMPORTANT DATES FOR SATCOM – 10 COURSE

Last date for Receipt of Applications	March 31, 2015
Information of Selection	April 30, 2015
Commencement of Course	August 1, 2015
Completion of Phase-I (in India)	April 30, 2016

INVITATION OF NOMINATION AND SPONSORSHIP

Nominations are invited from candidates in countries of Asia and the Pacific Region for the educational programme of the Centre. Nominations of candidates will have to be sponsored/endorsed by recognized institutions (e.g. ministries, universities etc.) in their respective countries. Sponsoring institutions should ensure that the returning scholar will contribute in a development oriented activity in the area of newly acquired knowledge and skills. The execution of a one year project work in their respective countries is the beginning of this process for which the nominating institution should ensure that essential facilities and support would be provided to the participant. During this one year period, the Centre will provide long distance scientific guidance.

SUBMISSION OF APPLICATIONS

All the participants from member countries are required to forward their application through respective GB members to the Indian High Commission/Embassy in respective country, who will then forward application to the course director. However, the participants from non GB countries need to submit duly filled application to the centre through Indian Embassy/High Commission in respective country.

Completed application forms should be sent through the Embassy/High Commission of the respective country to :

> Course Director, SATCOM-10, CSSTEAP
> Room No:27, Building No:24A
> Space Applications Centre, ISRO
> Ambavadi Vistar, Ahmedabad - 380 015, INDIA
> Tel. No. +91-79-2691 2427
> Fax   : +91-79-2691 5807, +91-2691 5821
> Email: cssteapsatcom@sac.isro.gov.in

The last date for receipt of completed applications is March 31, 2015. The application forms received from countries of Asia and the Pacific Region will be screened by the Centre and the selected candidates informed by April 30, 2015. Preference in selection will be given to those candidates, whose expenses are borne by themselves / sponsoring agency.

IMPORTANT (Please read carefully and note) :

1. Interested persons may detach last 4 pages from this brochure and use them as Application Form.

2. It is essential that full passport details are provided in the Application Form.

3. Application forms without passport details may not be considered.

4. Applicant should attach copies of certificate of

   a. Medical Fitness for diseases like HIV, TB, Hepatitis B, Cancer, etc. or any communicable diseases requiring medical attention is must for all the candidates. If any information is hidden or found during the course, the centre will be compelled to send the candidate back home at his/her own cost).

   b. Highest degree obtained (Degree certificate and mark sheet/grade card)

   c. Proficiency in English.

   d. All the degree certificates, if not in English may please be translated in English and attested by the Head of the organization or notary or transcript in English can also be submitted with seal.

5. Mail the completed application form through Indian Embassy/High Commission in your country and also send an advance copy of the application form directly to the above address.

6. Please send an advance copy of the application form duly signed by the nominating or sponsoring agency directly to the above given address or scanned copy via email (cssteapsatcom@sac.isro.gov.in) for quick processing.

7. You will be required to sign an undertaking at the time of registration that you will abide by the conduct rules and regulations of the institute. In case of the violations of the rules appropriate disciplinary action may be taken by the authorities as deemed appropriate, if needed it will be conveyed to your sponsoring organization and your Embassy in India.

ELIGIBILITY

Bachelor's Degree in Electronics / Telecommunications / Electrical Engineering or Master's degree in Science

(Physics, Electronics) or equivalent with at least 5 years of experience in teaching/research or professional experience in the field of Communication Engineering and/or related field. High School-level knowledge in mathematics and/or statistics is essential besides the Master degree as base qualification.

(For the candidates with higher qualifications, the minimum experience may be relaxed).

TARGET PARTICIPANTS

The course is directed towards the following categories of professionals.

- University Educators and Researchers.

- Professionals and Specialists.

- Telecom System Managers, Engineers and Planners.

It is expected that at the end of the programme, participating scholars will be able to

- Serve as catalysts for furthering the skills and knowledge of other professionals in their countries.

- They will contribute to policy making, planning, development and management of satellite communications and its applications in their countries.

- Enhance the self reliance of their countries so as to lessen dependence on external experts.

SELECTION OF CANDIDATES

Based on the completed application forms received, the Centre will select the candidates through a selection criterion by Selection Committee, which includes satisfying eligibility requirement, funding by nominating agency, sponsorer, country representation, proficiency in English language etc. Only selected candidates will be intimated by April 30, 2015 and list of selected candidates will also be put at CSSTEAP website (www.cssteap.org). Preference will be given to candidates whose nominating/sponsoring organization provides either both ways international air travel or one way international

travel or fellowship or both international air travel and fellowship.

ABOUT SPACE APPLICATIONS CENTRE (Host Institute)

Space Applications Centre (SAC) is an important and unique centre with a wide range of scientific and technical activities, with emphasis on utility of space technology for societal applications. Established in 1972, SAC is one of the lead Centres of the Indian Space Research Organisation (ISRO), engaged in the areas of development of sensors in optical, IR and microwave regions for remote sensing of earth resources, meteorology & oceanography; transponders for telecommunications & TV broadcasting, ground hardware and software applications. SAC has conceived and demonstrated several applications using space technology and also extended help to operationalise them.

The first societal application was through a unique experiment called the Satellite Instructional Television Experiment (SITE) conducted during 1975–76 followed by a communication technique developmental project called Satellite Telecommunications Experiments Projects (STEP), carried out with the French-German satellite, Symphony.

SAC embarked upon payload development with the India's first experimental communication satellite APPLE. The INSAT series of satellites were custom designed and deployed. Some of these also carried meteorological payload VHRR, payload for search & rescue, etc. The GSAT-2, carrying C band, Ku band, MSS followed by GSAT 3 (EDUSAT) which has national and spot beam, provide educational services through multimedia technology throughout the country. Presently wide range of GSAT series of satellites are upcoming for different societal and scientific applications.

Under the SATCOM and IT applications programmes, Digital Sound and Data Broadcast (DSDB), handheld MSS Terminals for fleet management applications and several other applications programs like tele-medicine, tele-education, science-channel, etc. have also been taken up.
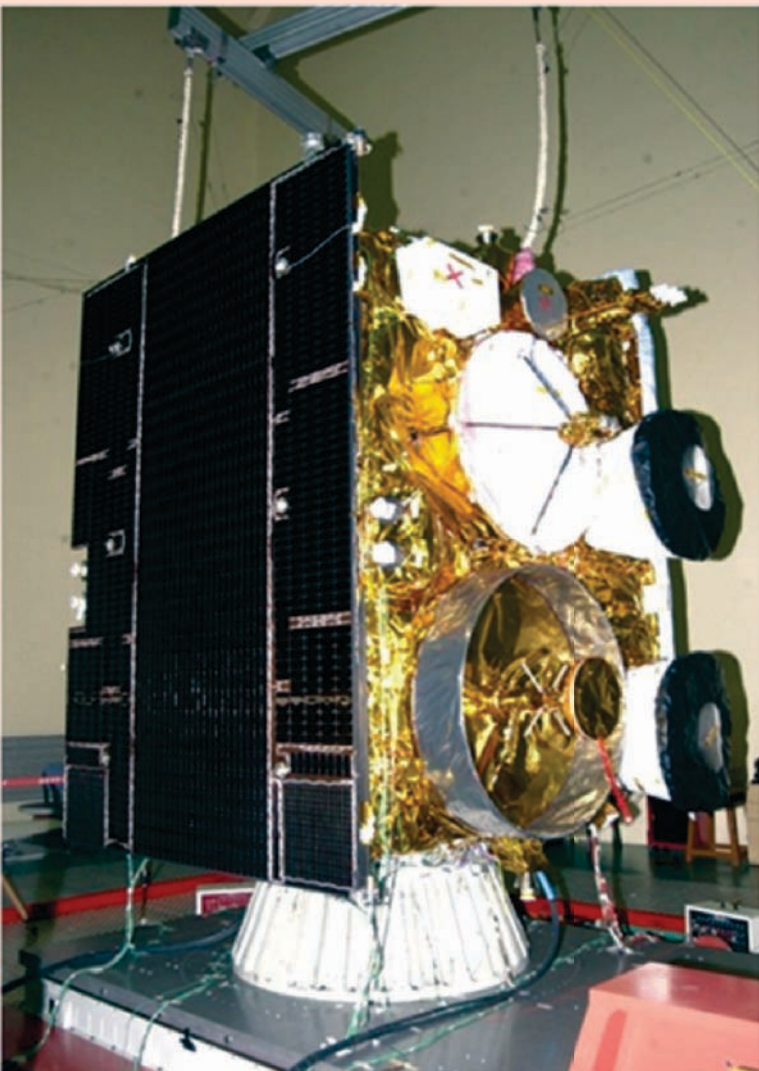
The meteorological activities at SAC basically involve payload design and fabrication and applications using the data received from such satellites. The initial phase of met applications data from Bhaskara were supplemented by data from NOAA, SEASAT, ERS etc. The INSAT-3D carrying 6 channel imager and 18 channel infra red sounder giving vertical profile of temperature and humidity in the atmosphere is deployed and sending the data successfully. The first exclusive meteorological satellite KALPANA-1 carried a VHRR and a data relay transmitter. ISRO has also launched the Oceansat -I with Ocean Colour Monitor (OCM), an optical sensor with 8 narrow spectral bands with high resolution and higher dynamic range and Multi frequency Microwave. Another major activity underway is the Megha-Tropiques project, a collaborative programme with CNES, France and it is fully operational with its data products are disseminated to users.

SAC has also established and operationalised a Meteorological and Oceanographic Data Archival Centre (MOSDAC) at its Bopal campus with a view to disseminating quality data products from ISRO satellite missions on near real time basis and to promote synergy of different sources of satellite data in to practical and usable data sets for R&D in atmospheric and oceanic studies.

SAC plays a very important role in the nations Remote Sensing programme. The first phase saw the development of airborne thermal sensors such as Infrared (IR) scanner, multispectral scanner, linear Charge Coupled Device (CCD) camera, Side Looking Radar, Colour Infrared (CIR) based photographic systems and a number of photo interpretation & ground truth equipment.

In the second phase the IRS–1A programme was successfully launched and the users started receiving multispectral imagery with 36m resolution.

ISRO is embarked on the space exploration with Chandrayaan-1 and Mars Orbiter Mission (MOM) with Chandrayaan-2 on pipeline. SAC has significantly contributed in realizing of Chandrayaan payloads and
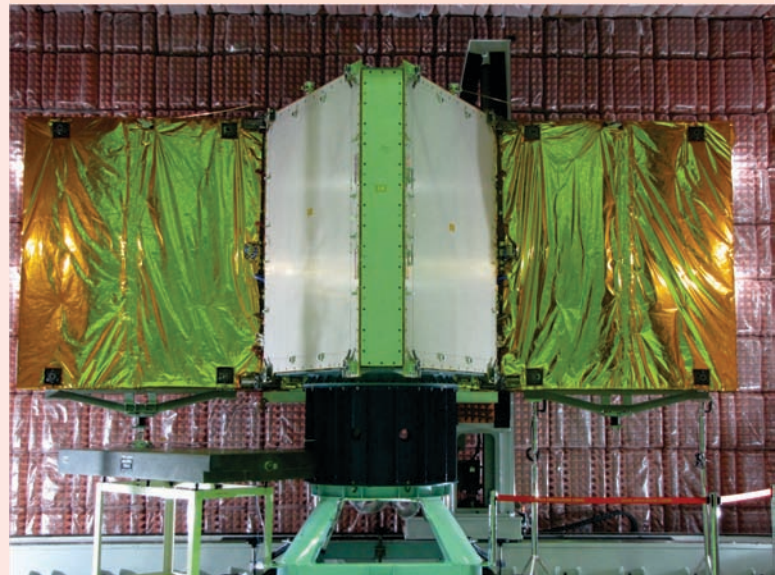
analyzing the chandrayaan-1 data. SAC has played key role in developing the payloads for MOM.

The centre is situated in the western outskirts of the city of Ahmedabad in Gujarat State, Western India. A new SAC campus is established about 8 km away from the main campus which houses training facilities and housing complex for the participants of CSSTEAP.

FACULTY

The faculty for the course constitutes Scientists and Engineers in different fields, drawn from Space Applications Centre, other Centres of Indian Space Research Organisation (ISRO) and various other agencies/universities from India and other countries, mainly from Asia and the Pacific region. These experts have long and varied experience in the field of Telecommunication, Satellite Communications and their applications. The core faculty has a strong scientific background with a number of publications, experience of participating in international scientific programs and organizing a number of courses to their credit.

MEDIUM OF INSTRUCTIONS

The language of the courses is English. *Proficiency both in written and spoken English is MUST. Candidates not proficient in English should not 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 in the country or by the local UNDP. The head of the nominating/sponsoring organization need to affirm the applicant's competence in spoken and written English language. Preference will be given to those who have secured high score in TOEFL examination. Supporting document regarding the accreditation of the institute should be enclosed along with the application.

COURSE METHODS & TEACHING AIDS

ISRO has developed expertise in satellite communication over the four decades and launched communication as well as earth observation satellite. Modern methods of teaching and instruction will be used for imparting training during the course. Printed course

material of the lectures will be supplied. The course methods include classroom lectures, video lectures, computer-based training packages, laboratory experiments, group discussions, demonstrations, seminar presentation and field work/case studies (as applicable). Computer-based interactive packages will also be used for self learning.

TECHNICAL TOURS

As part of the course, the participants will have the opportunity to visit different centres of ISRO/Dept. of Space, Govt. of India and other organisations concerned with Satellite Communications.

FACILITIES

Space Applications Centre (SAC) has state of the art Earth Stations and various well equipped laboratories where Research & Development on Satellite Communication and related topics are carried out. SAC has the entire infrastructure to design, develop and fabricate the Satellite Payloads and Earth Station hardware. SAC also has the capability for installation and commissioning of Earth Stations on turn-key basis and provides consultancy services to various agencies in building the Earth Stations in the country.

EVALUATION PROCEDURE

The performance of the participants in the Centre's programs will be assessed through both external and internal theory, practical and computer-assisted interactive assessments at periodic intervals during each semester of the course. Participants who are not able to qualify in the prescribed examinations for the 9-months course may be considered for award of only a **"Certificate of attendance"** by the Centre.

AWARD OF DIPLOMA/DEGREE

On successful completion of the Phase-I of the 9-months course, the Centre will award Post Graduate Diploma/Certificate. If the participant is able to complete Phase-II Project work i.e. research project in home country satisfactorily within four years of joining of PG Course, the candidate can avail opportunity to submit the work to Andhra University (India) for award of M.Tech.

degree to the participants who satisfy the admission requirements of Andhra University.

COURSE EXPENSES

The overall expenses for the Course include, besides the international travel (to and from Ahmedabad), the course fee, living expenses and local tours, as given below.

Course Fee - Approximately US$ 6000 per participant

Local tours - US$ 1200 per participant

Living expenses - US$ 1100 per participant

The participants are expected to find suitable sponsorship or funding for meeting the expenses while attending the course in India. Preference will be given to such candidates.

FINANCIAL ASSISTANCE TO PARTICIPANTS

For the current Course, Government of India (GOI) has offered to waive off the course fee of US $ 6000 per participant of the Asia-Pacific region selected by the Centre. Thus, no course fee is payable by the selected participants from the Asia Pacific region. However, preference will be given to sponsored candidate.

Government of India has also offered a limited number of Fellowships consisting of the following:

· Living expenses in India - INR. 16,000 per month for the duration of 9 months.

· Book allowance – INR 2,000 (one time)

· Project allowance – INR 1500 (one time)

· Local tour & travel expenses – Up to INR 50,000

The Centre is trying to obtain financial assistance for international travel for a limited number of participants of the Asia-Pacific region through agencies like UN Office for Outer Space Affairs (UN-OOSA), UN Economic & Social Commission for Asia and the Pacific (UN-ESCAP).

Candidates proposing to avail the GOI Fellowship and the international travel assistance have to specifically request for the same in Application Form. Candidates who are not offered GOI Fellowship and travel
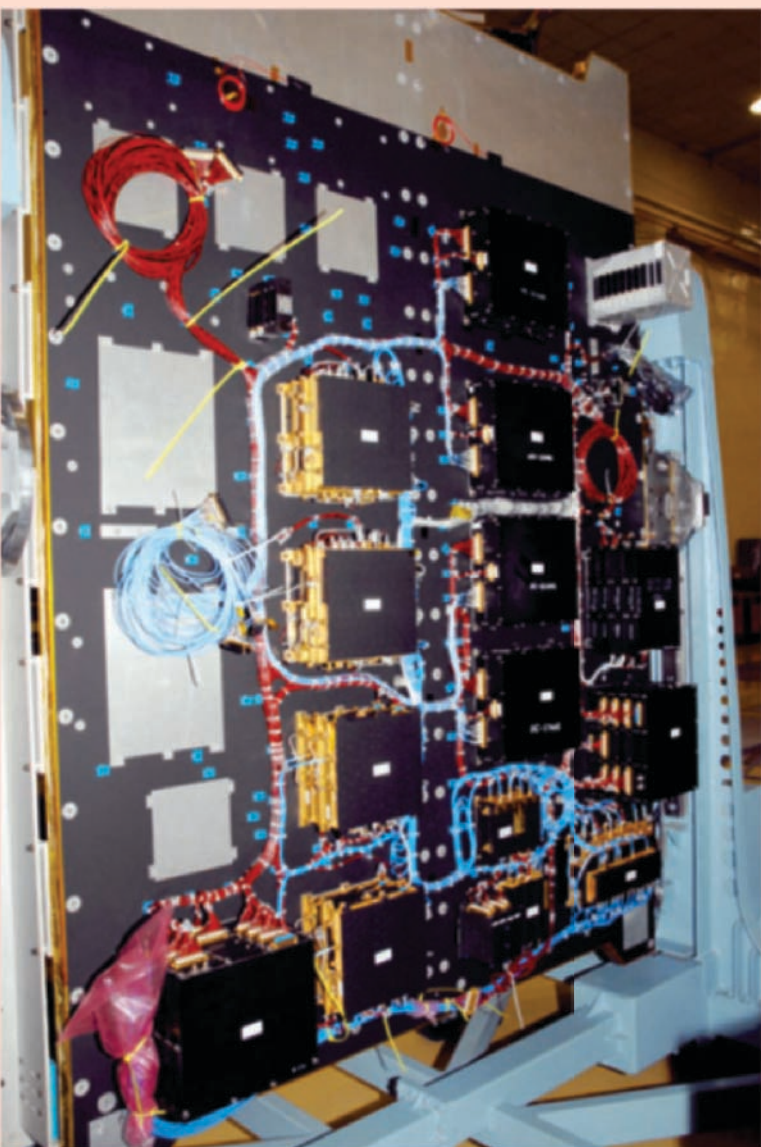
assistance, have to make their own arrangements for living expenses and international travel.

HEALTH AND LIFE INSURANCE

Medical, life and disability insurance should be undertaken before reaching India, by the participants themselves or on their behalf by their nominating/sponsoring institute/organisation for covering entire health and disability risks. No medical expenses will be borne by the Centre. However, participants who receive the Fellowship of the GOI will be paid medical expenses for minor ailments on actual basis (as out patients only) as and when such expenses are incurred. The centre will have only limited liabilities as far as medical expenses are concerned in such cases. *Candidates must clearly specify if they are suffering from any health disorders which may affect their study programmes. Candidates in sound physical and mental health only need to apply.* Participants, who are not covered by appropriate Medical insurance while in India, would be required to take a Medical Insurance policy in India by themselves.

Medical fitness certificate from Authorised 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 application form.

(*In case if any medical information requiring attention is hidden and if found during the course, the centre will be compelled to send the candidate back home and all expenses towards the same will be borne by the candidate/sponsoring organization.*)

ACCOMMODATION

Accommodation for the participants only will be arranged in Hostel. Kitchen facility will be available to the participants. A sum of INR 1500/- per month is to be paid by each participant towards accommodation charges. Boarding and other expenses such as cooking gas are to be borne by the participants. Spouse/any other person will not be allowed to stay along with the candidate in the hostel during the entire tenure of the course. Staying in

hostel is compulsory for all the participants and staying outside is strictly not allowed.

COURSE AT A GLANCE

PHASE – I: COURSE CONTENTS

Phase – 1 of the course consists two semesters including the Pilot Project in the second semester. Each semester covers specific areas of Satellite Communications. Broad topics covered in each semester are given below. Laboratory experiments and practical demonstration using earth station will be conducted in all the subjects wherever applicable.

SEMESTER 1
Introduction to Communication System
Principle of Communications and Networking
- Communication Over view
- Principle of Information Theory and Mathematical Tools
- Principle of Modulation and Coding
- Microwave Theory and Techniques
- Optical Communications
- Principles of Networking and Protocols
- Data Networking
- Computer Organisation

Introduction to Satellite Communication Systems
- Introduction to Satellite Communications
- Satellite Orbits
- Launch Vehicles and Launching of Satellites
- Satellite Communications Links
- Frequency Bands for Satellite Communications
- Propagation Affect on Satellite Communication Links
- Satellite Configurations
- Satellite Bus Sub-Systems
- Communication Transponder
- Communication Transponder Sub-Systems
- Communication Transponder On-Board Processing
- Integration and Testing of Communication Transponder
- In-Orbit Check-Out of Communication Satellite
- Reliability and Space Qualification
- Reliability of Satellite Communication Payload
- Electrostatic Discharge Hazards in SatCom Electronics
- EMI, EMC and RFI
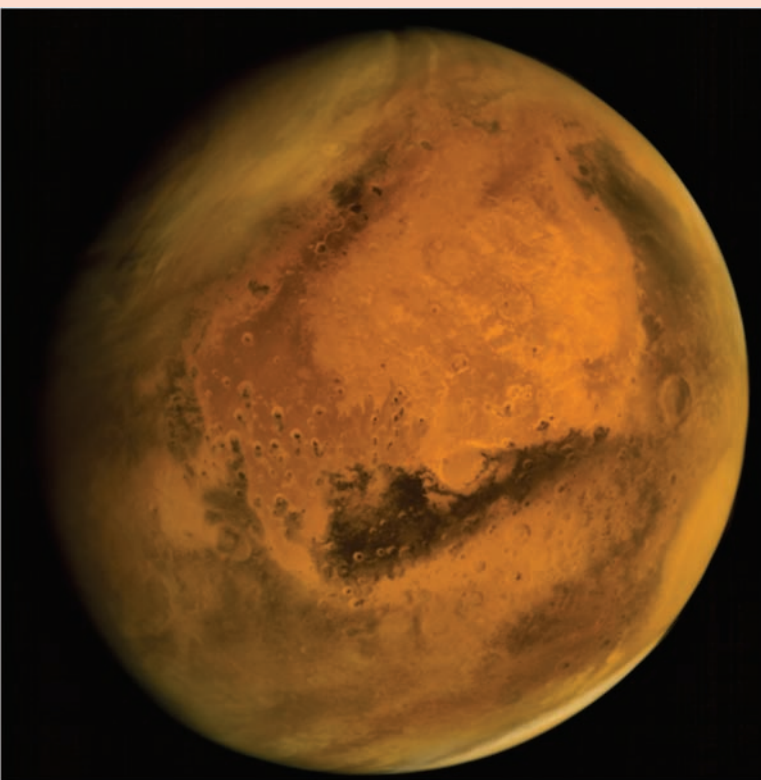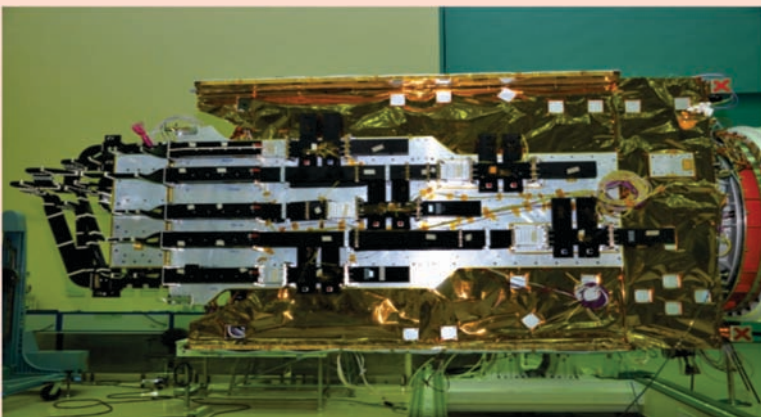
- Radiation effects
- Space Environment

Digital Signal Processing
- Discrete Time Signals and Systems
- Sampling of Continuous Time Signals
- Z-Transform
- Discrete Fourier Transform
- Computation of Discrete Fourier Transform
- Structure for Discrete Time Systems
- Filter Design Techniques
- Wavelet Transforms
- Signal Compression
- Examples of DSP based subsystems for Satellite Communications

Modulation, Multiplexing and Multiple Access
- Analog and Digital Modulation and Demodulation Techniques
  (AM/ FM/ PM/ M-PSK/ MSK/ Hybrid)
- Transmission Impairments
- Source Coding of Video & Audio signals
- Channel coding
- Multiplexing /De-multiplexing
- Spread Spectrum Techniques
- Multiple Access Techniques

Seminar
Topics on societal applications based on Satellite Communications

SEMESTER II
Earth Station Technology
- Satellite Communications Earth Station – An Overview
- Technology of Earth Station Sub-Systems
- Earth Station Design Considerations
- Earth Station Standards
- Checkout of Earth Station
- Operations & Maintenance of Fixed and Transportable Earth Station
- Fabrication Techniques

Broadcasting using Satellite Communications
- Analog & Digital Broadcasting Systems & Standards
- Satellite TV and Access Systems
- Internet Protocol (IP) over Satellite
- Selected Applications
- Satellite News Gathering (SNG) for Radio and TV
- Radio Networking
- Digital Audio Broadcasting

- TV Studio and its Operations/ Outdoor Broadcasting Van
- Video Conferencing via Satellite
- Multimedia & IP TV
- Video On-Demand

Applications and Trends in Satellite Communications

- Satellite Communications Services and Applications
- Rural/ Remote Area Communication
- VSAT Network for Voice, Data and Fax
- Elements for VSAT Network
- Automatic Weather Station
- Disaster Management Using Satellite Communications
- Search and Rescue System
- Warning Dissemination System
- Telemedicine
- Time and Frequency Transmission System
- Tele-Education Systems
- Mobile and Personal communications Services
- Strategic Satellite Communication System
- Satellite Navigation System
- Satellite-based Internet System
- Multimedia Broadband Satellite Systems
- Future Trends in Satellite Communications

Operational Communication Satellite Systems Network Planning, Management, Operational Issues

- Overview of Operational Satellite Communications Systems
- Operational Communication Satellite Systems
- International Telecommunications Union (ITU) & Other Standardization Organisations (ISO, APT, ETSI)
- International Regulations
- Technical Considerations for Network Planning
- Planning for Space Segment
- Planning for Ground Segment
- Network Operations and Control
- Management of Communication Satellite Operations
- Intra-system/ Inter-system Interference Coordination
- Satellite Communication Policy, Regulations and licensing,
- Space Law
- Financial Aspects of Satellite Communication

PILOT PROJECT

The topics covered in the pilot project will be oriented towards the one year project to be carried out in the home country.

PHASE – II: ONE YEAR PROJECT

Each scholar, after completing Phase-I of the course, will have to carry out an approved project in his/her home country for a period of one year. This is to be formulated jointly by the scholar and his/her advisor at the centre during Phase-I in an area relevant to the development of the sponsoring institution/country. The sponsoring institution/country is obliged to guarantee on the return, the scholar will be provided all facilities to carryout the work. In order to make the best use of the knowledge and skill acquired by the participant, the sponsoring agency is also expected to ensure that the returning scholar would remain in a suitable position with commensurate and progressive remuneration and other entitlements for a minimum period of 3 years and will be provided all facilities to carry out the work. However, few meritorious students will be awarded five months to one year fellowship as per the desire of the candidate to complete their one year project work at CSSTEAP, India. The awardee will be provided support for international travel, travel in India and fellowship.

This course programme will be considered complete on acceptance/approval of the submitted project report in the form of dissertation.

ABOUT ANDHRA UNIVERSITY

Andhra University was established in 1926. It is a premier institute of higher learning and it became a trend-setter in higher education and university administration. It is accredited with 'A' Grade by National Assessment and Accreditation Council of India and is the first composite university in India to get ISO 9001 – 2008 certificate. Andhra University is a multi-disciplinary university. The University has strong faculty and was headed by the greatest personalities like Dr. C.R. Reddy, and Dr. Sarvepalli Radhakrishna and others as Vice-Chancellors. Andhra University is considered to be one among the 14 best Universities in India in terms of

Research by the Department of Science and Technology, Govt. of India. Andhra University College of Engineering (A) has been considered to be one among 6 best Engineering colleges in India for up-gradation to IIT status. It is one of the biggest Engineering Colleges which has large no. of Engineering Departments offering UG and PG programmes. It has chemical, Electronics and Communication, Computer Science and Systems, Civil, Mechanical, Remote Sensing, Marine, Naval Architecture, Architecture and Planning, Metallurgical, Instrument Technology, Environmental, Electrical and Electronics Engineering Departments. It also offers PG programmes in 42 specializations in the above Departments including Nanotechnology, Bio-Informatics, Bio-Medical, Geo-Informatics etc. All the courses are accredited by NBA for 5 years indicating 'A' Grade.

ABOUT AHMEDABAD CITY

Ahmedabad is an important business centre in western India. A large number of textile mills and other industries are located in and around Ahmedabad. Well-known educational and research institutions like Indian Institute of Management, Indian Institute of Technology, Physical Research Laboratory, Ahmedabad Textile Industries Research Association, National Institute of Design, Space Applications Centre, Institute of Plasma Research etc. are located here in addition to two Universities namely Gujarat University and Gujarat Vidyapeeth.

The famous Sabarmati Ashram, from where Mahatma Gandhi, Father of the Nation organized the non violent movement during India's freedom struggle, is also situated here.

Ahmedabad is well connected to all important cities of India by air, rail and road. International airports of Delhi and Mumbai are about an hour's flight time from Ahmedabad. A few international flights also touch and originate at Ahmedabad.

The 9-day dance festival of Garba (October-November), followed 20 days later by the light and cracker festival of Divali, the kite festival of Makarsankranti (January 14) and the colour festival of Holi (March) are occasions to enjoy in Ahmedabad. Summers from March to June are very hot. Rainfall in the area is moderate to low. November to March the weather is pleasant.

CSSTEAP

**CENTRE FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION
IN ASIA AND THE PACIFIC**
(AFFILIATED TO THE UNITED NATIONS)

**APPLICATION FORM FOR TENTH POST GRADUATE COURSE IN
"SATELLITE COMMUNICATIONS"**

August 1, 2015 to April 30, 2016
at
Space Applications Centre, Ahmedabad, India
Last date for receipt of application: March 31, 2015

SATCOM-10
(For office use only)

Application No.:………………………….

Date Received :………………………….

(Please type or use **CAPITAL LETTERS**)

Affix
Affix
Recent
Passport size
Photograph

Important:
All the correspondence from CSSTEAP (issue of admission letter, e-tickets for travel, enquiries etc) with the application will be through emails on internet and sometimes on phone (Home/Office), therefore kindly ensure that emails-id(s), phone(s), fax, etc, are correctly and clearly mentioned.

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1.   Name (Dr/Mr/Mrs/Miss): ………………………………………………………………………………….….......
                                   (As mentioned in the Passport)
2.   Father's Name: …………………………………… 3. Name of mother/husband/wife: ………………..

4.   Date of Birth (DD/MM/YYYY): ……………………….**5.** Place of Birth: ……………..………………….……
6   Gender (Male/Female): ……………………………**7.** Nationality: ……………………….………….…………
8.   Contact Information: Present official Address (Valid until what date):
     ……..
     ……..
     Contact number: (Please give complete Phone No. with <u>country, city</u> codes)
     Home: ……………………………..………… Office: ……………………………………………………....
     Mobile:…………………………………………
     Fax: ………………………………………….. E-mail: ……………….……………………..………………..

Important:
a)   Interested persons may detach last 4 pages from this brochure and use them as Application form.
b)   It is essenial that full passport details are mentioned in the Application Form or provided to the Centre at the earliest.
c)   Application Forms without passport details may not be considered.
d)   Providing alternate email-id would ensure timely communication with applicants.
e)   Please note, for faster communication with the applicants, CSSTEAP Secretariat will be using your email-id for all purposes (e.g. admission letter, air tickets and logistic arrangement.

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9.   Permanent home Address (in your country):
     ……….……..
     ……….....
     ……….……….

     Contact number: (Please give complete Phone No. with <u>country, city</u> codes)
     Telephone:…………………………………………………………………………………………………….....
     Fax: ……..…………………………………………………………………………………………...………...
     E-Mail (alternate, preferably G-mail or Yahoo):………………………………………………………………

10. Nearest International airport (Specify the place/city):……………………………………………….……….

11. ACADEMIC QUALIFICATIONS:

Degree/(Bachelor/ Master)/ Diploma	Duration of Course (mention from which year to year)	University/ Institution Name	Year of passing	Grade/ Percentage	Major subjects/ specialization

(Enclose copies of Degree/Diploma/Certificates/marks/ grades obtained etc. and their certified translation in English)

Major subjects in last examination: ……………………..……………………………………………………….

Area of Specialization: …………………………………………………………………………………………

Medium of Instruction/Language:……………………. TOEFL Score: …………………………………………

Proficiency in English – tick (√) in appropriate item below:

      Reading : Fair, Good, Very Good, Excellent

      Writing : Fair, Good, Very Good, Excellent

      Spoken : Fair, Good, Very Good, Excellent

(Enclose certified copies of marks/grades of degree, diploma, TOEFL(validity period), etc. certificates and their certified translation in English)

12. DETAILS OF EXPERIENCE:

(a) Present Position: …………………………...………………………………………………………………...

Present Responsibilities *:.…………………………………………………………………………………...

Organisation and Complete Address……………….……………………………………………………………

……..

Date of joining this Organisation (dd/mm/yyyy): ……...…………………………………..……………………...

 * Attach additional sheets giving details of your technical activity during last one year (2013-2014)

(b) Experience during past 15 years:

Name of the Organisation(s)	Position(s)/Post(s) held	Nature of work done	Duration

13. (a) Activities & Projects in which your present organization is engaged (mandatory) and nature of your duties *

……

……

……

(b) Main Scientific/Technical facilities available in your organization *
   (Including approximate number and type of computers, type of software available etc.)

   ………
   ………
   ……………………………………………………………… ……………………………………………………….

   *If required attach separate sheet.

14. Have you done any other course from CSSTEAP (If 'yes'; please give details including the month & year)

   ………
   ……………………………………………………………………………………………………..……………..

15. How do you foresee, the proposed PG Diploma Course in SATCOM will help you

   ………
   ………

16. **DETAILS OF PASSPORT :** Please provide valid passport details below and if not holding a valid passport, please forward copy of the passport whenever available.

Passport Number	Place of Issue (City and Country)	Date of Issue	Passport Valid up to	Issuing Authority	Whether previously visited India if so place and date of last visit

17. **PHYSICAL FITNESS:**

a) Are you suffering from any recurring/chronic/serious communicable disease which may affect your study program in India?

b) If yes, please specify nature of illness (Candidates are advised to attach medical fitness certificate from a government hospital or government recognized hospital on hospital letter head)

18. How do you propose to meet the international travel & stay expenses in India? (preference will be given to those who will make their own travel or both travel and stay arrangement himself/herself)...................……………………………………………................…………………………………………
………………………………………………………………………………………………….

19. **DECLARATION BY THE CANDIDATE:**

I have read the announcement brochure and will abide by the rules and regulations of the Centre and maintain discipline harmony and will not indulge in unlawful activities in campus hostel or during educational and field visits. I have made/ am making/ have not made travel arrangements for attending the course and local expenses for the period of stay in India.

Date :

Place: Signature of Candidate

20. **SPONSORING / NOMINATING / ENDORSING AGENCY CERTIFICATE:**

Dr/Mr./ Ms………..………………………………………………..................... is sponsored/ endorsed by…………………………………………………… to attend the **Tenth Post Graduate Course in**

"Satellite Communications" to be held at Space Applications Centre, Ahmedabad, India during August 1, 2015 – April 30, 2016. We envisage to utilize his/her experience in specific tasks of our organization / agency. The candidate will be allowed to carryout the project work for a period of one year after his/ her return to this country and will be provided with all the facilities required for the same. Following statements are mandatory for certification by the sponsorer.

a) He/ She will be/ will not be provided international travel support. ☐ } (Mandatory:
b) He/ She will be/ will not be provided financial assistance for the period of stay in India. ☐ } Please tick
c) He/ She possesses adequate knowledge of English Language required for the course. ☐ } appropriate option)

Date :   Signature:
Place :   Name in Capital Letters:
                                    Designation :
                                    Phone No :
                                    Fax No :
                                    Email :

(Official Seal of the sponsoring or nominating authority)

Note: Application without official seal of sponsoring or nominating authority and their details will not be considered

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21. **FORWARDING NOTE BY THE RESPECTIVE INDIAN EMBASSY/HIGH COMMISSION IN YOUR COUNTRY OR YOUR EMBASSY/HIGH COMMISSION IN INDIA, NEW DELHI**

This is to forward the application of Dr/Mr. / Ms. …………………………………………………………………. of …………………………………… (Specify the Country Name here) for the 9 months Post Graduate Course in SATCOM - 10 of CSSTEAP to be held at Space Applications Centre, Ahmedabad, India during August 1, 2015 – April 30, 2016.

Date :   Signature
Place :   Name :
                                    Designation:
                                    Phone No:
                                    Fax No :
(Official Seal of the Embassy/High Commission)   Email :

Note : **Application without official seal** of the Embassy or High Commission will not be considered
N.B. Please send an advance copy of the application form duly signed by the sponsoring agency to the Course Director SATCOM-10, Space Application Centre, Ahmedabad, India by fax (+91-79-2691-5807) or Email to cssteapsatcom@sac.isro.gov.in for quick processing. Original copy to be sent through Indian Embassy/High Commission of your country after duly signed the sponsor or through your Embassy/High Commission in New Delhi, India.

(**IMPORTANT**)

- The Application which is not complete in all respects is likely to be rejected.
- Candidates must attach copies of certificates of:
  a. Medical fitness to attend the course including Chest X-ray (PA), Blood Test (including Random Blood Sugar, HIV, HBs, Ag), Urine complete *(in case any medical information requiring attention is hidden and if found during the course, the centre will be compelled to send the candidate back home at the cost of nominating agency or candidate)*.
  b. Attach copy of Highest degree obtained (Degree certificate and marks sheet/grade card)
  c. Proof of Proficiency in English needs to be provided or certificate provided by the nominating agency.
  d. Attach copy of All Degree Certificates, if not in English, may please be translated in English and attested by the Head of the organization or transcript in English can also be submitted.
- Expecting mothers are advised to take a judicious decision before applying and joining the course.
- Smoking and consuming alcoholic drinks in class room and office campus is prohibited.

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IMPORTANT DATES FOR SATCOM – 10 COURSE

Last date for Receipt of Applications	**March 31, 2015**
Information of Selection	**April 30, 2015**
Commencement of Course	**August 1, 2015**
Completion of Phase-I (in India)	**April 30, 2016**

Mail the application form on the address given below <u>through</u> Governing Board member (list on inside of the front cover page of this brochure) to Indian Embassy/High Commission in your country.

To.

Dr. Raghunadh K Bhattar
Course Director, SATCOM-10, CSSTEAP
Space Applications Centre
Indian Space Research Organisation
Department of Space, Govt. of India
Ambawadi Vistar P.O.,
AHMEDABAD – 380 015 – Gujarat (INDIA)
Phone   : (O) +91 – 79 – 2691 2427
Fax   : +91 – 79 – 26915807
Email   : cssteapsatcom@sac.isro.gov.in

Note: Also mail an advance copy of the application form signed by the sponsors to the same address for taking necessary advance action.

CENTRE FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION IN ASIA AND THE PACIFIC
(AFFILIATED TO THE UNITED NATIONS)
NINTH POST GRADUATE DIPLOMA COURSE
IN
SATELLITE COMMUNICATIONS
VALEDICTORY FUNCTION
(April 28, 2014)
SPACE APPLICATIONS CENTRE – ISRO, AHMEDABAD

CSSTEAP