

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



# **ANNOUNCES**

**THIRD INTERNATIONAL TRAINING COURSE  
ON  
NAVIGATION AND SATELLITE POSITIONING SYSTEM**

**JUNE 16, 2014 TO JULY 11, 2014**

*Conducted at*



Space Applications Centre  
Indian Space Research Organisation  
Ahmedabad, INDIA  
[www.sac.gov.in](http://www.sac.gov.in)



Centre for Space Science and Technology  
Education in Asia and the Pacific  
(Affiliated to the United Nations)  
[www.cssteap.org](http://www.cssteap.org)

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UN Office for Outer Space Affairs (UN-OOSA)  
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### Secretary

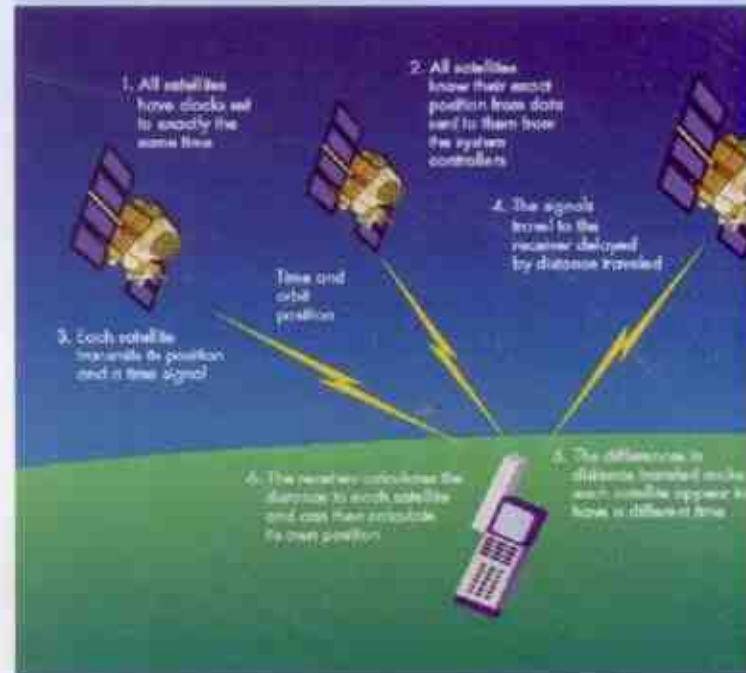
Dr. Y.V.N. Krishna Murthy  
Director, CSSTEAP,  
India





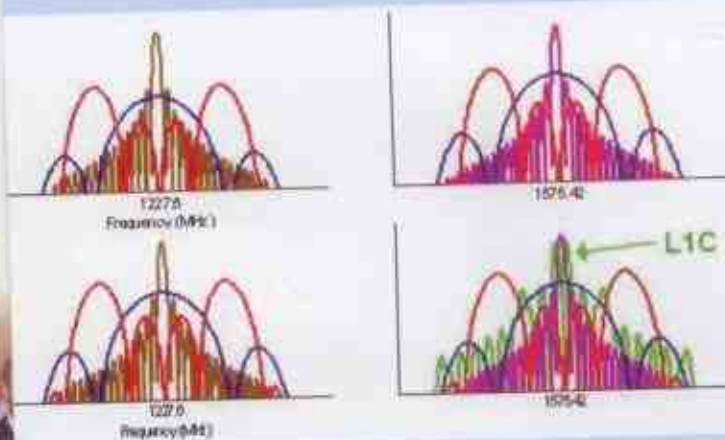
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## Background

Satellite navigation is an important part of the modern life. Combined with the applications like Google maps, satellite positioning has become integral part of travel. It has become a necessary part of several operations. Currently the US GPS and Russian GLONASS are the only systems in the Global Navigation Satellite Services (GNSS). Along with this other countries/unions like India, Japan, France and Europe are coming up with their own Satellite Positioning Systems. In this direction, India has already launched its first navigation satellite called IRNSS-1A, part of the constellation of seven satellites covering the Indian land mass. These initiatives by different countries are likely to increase Satellite Launch Vehicles, signals and their coverage providing higher accuracies even in bad weather conditions. This development along with miniaturization of GNSS receiver has exploded its applications in many fields. Capacity building would be the next step for efficient use of the technology along with other remote sensing techniques for monitoring of various natural resources and for societal development. There has been a large gap between the technology developing and application communities by which efficient use of positioning technology is lagging behind. This gap can be reduced by training the professionals, researchers and user groups at different levels by transferring the state of art technology to application community through capacity building. The awareness of various existing and upcoming positioning systems among the decision makers would be helpful in efficient use of high-end navigation and positioning systems for development of community. The 3<sup>rd</sup> such short course on Navigation and Satellite Positioning Systems is being organized.



## Objectives

- To create an awareness of existing and upcoming satellite positioning technology.
- To expertise researchers and professionals in utilization of latest positioning technology.



- To update on going activities related to the use of GNSS technology.
- To fill the gap between the latest satellite positioning technology and application groups and
- To maximize the benefits of the use and applications of GNSS to support sustainable development.

### Who should attend?

The prospective participants should be from the Asia-Pacific region, and should be Post Graduates Science or Graduates in Engineering in a relevant discipline with about 5 years experience in using space technology applications.

The Course is targeted to middle level technology managers, researchers, and professionals working in the domain of GNSS and remote sensing technology and their applications. It is hoped that the concerned Government departments as well as NGOs/stakeholders would benefit from this training course. Others who will find the course very useful include academic institutions, space agencies, and institutions responsible for regional capacity building in the use of space based technology.

### Course Duration, Location and Number of Seats

The course will be conducted by CSSTEAP and organized by Space Applications Centre, ISRO, Ahmedabad, India, at its Bopal Campus from June 16, 2014 to July 11, 2014. The number of seats will be limited to 20.

### Language

The working language of the course is **English**. Proficiency in written and spoken English is most essential. **The candidates having adequate working knowledge in English only need to apply.**

### Course Structure

The structure of the course is a balance between theory and practical exercises. The Training Course schedule will be covered in four modules distributed in four weeks:



### Week 1: Introduction to GNSS

- Evolution of Navstar, GPS concept from transit, timing
- GPS signal structure
- GLONASS, Galileo navigation systems
- Coordinate systems and transformation
- Overview of satellite communication

### Week 2: GNSS Signals

- Satellite orbital dynamics, GPS orbits
- Satellite & user position algorithms
- GPS signal structure & navigation data
- PRN sequence [C/A & P code generation and their correlation properties]
- Time domain representation of GPS signals GPS signal spectrum and their power level
- Concept of Fourier transform, autocorrelation and cross correlation of GPS signals
- Error sources that effect GPS system performance

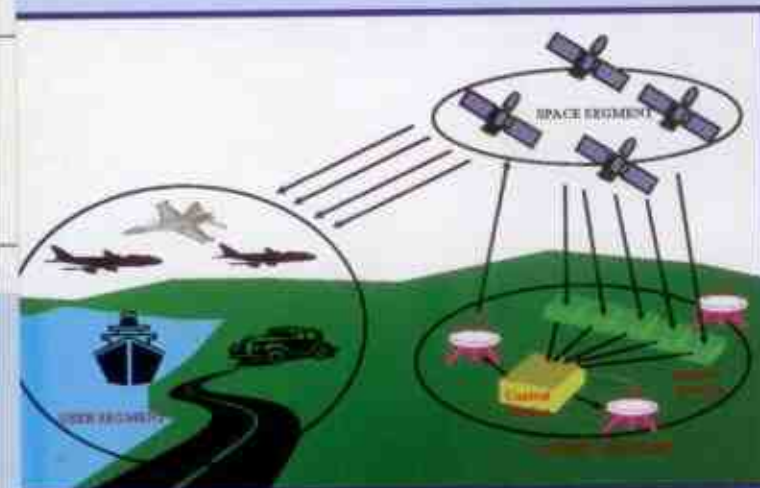
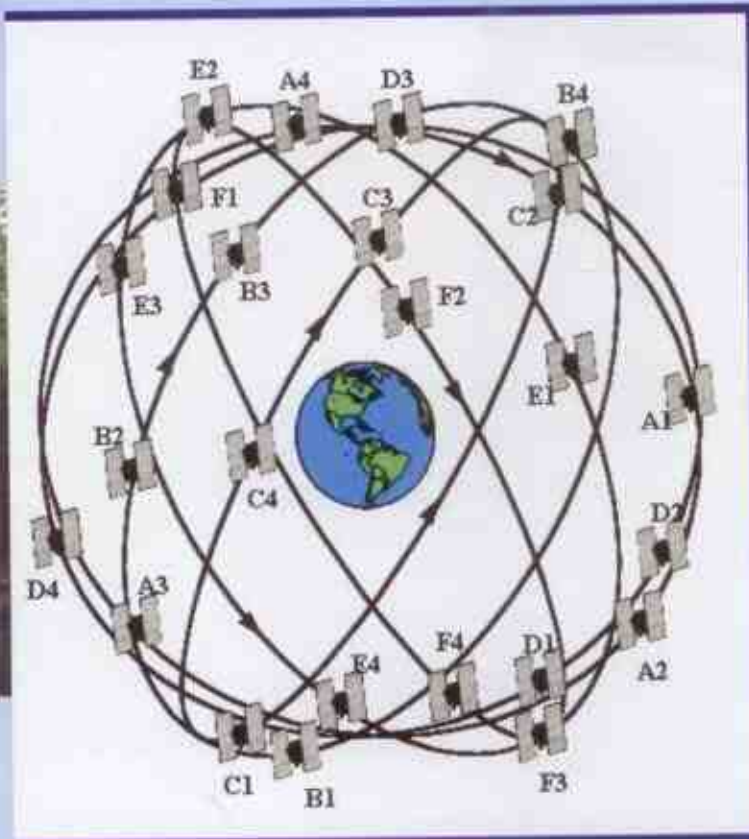
### Week 3: Differential Positioning

- GLONASS signal modulation
- GPS Augmentation
- Differential GPS concepts
- GPS receiver signal processing

### Week 4: GNSS data processing and applications - Scientific and Commercial

- Surveying with GPS
- GNSS applications
- GPS for atmospheric studies, perceptible water vapor
- Applications in aviation: (automation approach and landing using GPS)
- Applications for vehicle tracking
- Location based Services
- Surveying and mapping
- Mobile Mapping
- Earth rotation measurement, seismology (Tectonic plate movement)
- GNSS altimetry

There will be practical exercises with different types of GNSS receivers integrated with communications systems and visits to laboratories at SAC.





### Course Fee

A course fee of Indian Rupees (INR) 25,000 (equivalent to US\$ 500) is charged. This includes course materials and local tours.

### Fellowships to Participants from Countries other than India

Candidates are expected to make their own arrangements for all expenses. Preference will be given to the candidates who are financially (travel and/or fellowship) supported by their organizations or any other funding agency. However, for a few candidates Government of India (GOI) offers financial support. Candidates proposing to avail the GOI financial assistance (16,000 per month and to & fro travel support) have to specifically request for the same in the Application Form.

### Health and Insurance

Insurance and medical expenses as necessary will have to be borne by candidates or their organization before taking the journey to India. Medical, life and disability insurance should be undertaken before leaving for India by the participants themselves or on their behalf by their organization for covering entire health and disability risks. No medical expenses will be borne by CSSTEAP. 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. CSSTEAP will have limited liabilities as far as medical expenses are concerned in such cases.

### Accommodation

Accommodation only for the participants will be arranged in a hostel inside the campus (spouse or family members not allowed). Kitchenette facility will be available to the participants only. A sum of INR 1500 per month is to be paid by the participant for the accommodation. Boarding and other expenses are also to be borne by the participants. Indian food can be provided on payment of actual charges for the entire period of the course.





### Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP)

In the wake of the need for regional self-reliance and self sustenance in space science and technology applications in the region of Asia and the Pacific, CSSTEAP came into existence with affiliation to the United Nations in India in 1995. It has been supported by the Department of Space of the Government of India, and is advised/guided by a 18 member international Governing Board. Its activities span across organization of P.G. Courses of 9 months duration in Remote Sensing and GIS, Satellite Communications, Satellite Meteorology and Global Climate, and Space and Atmospheric Science. It also conducts theme specific short courses in all these disciplines. The Centre also encourages and provides support to carryout Master programme. Since its inception, CSSTEAP has trained about 1274 individuals from more than 34 countries of the Asia and the Pacific region and beyond (for further details see website: [www.cssteap.org](http://www.cssteap.org)).

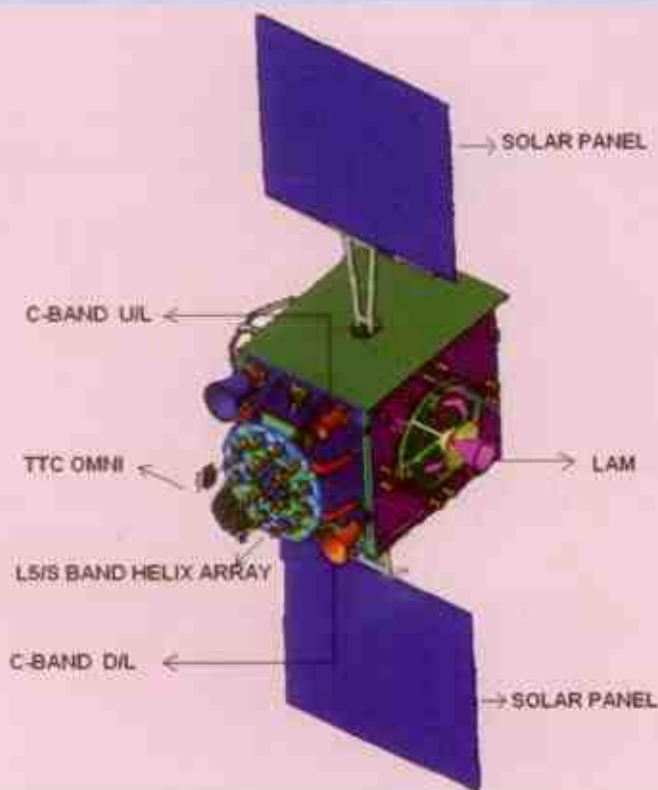
### Space Applications Centre (SAC)

Space Applications Centre (SAC), one of the major Centres of the Indian Space Research Organisation, is engaged in the research, development and demonstration of applications of Space Technology in the fields of Communications, Remote Sensing, Meteorology, and Satellite Navigation. This includes R&D on onboard systems, ground systems and end user equipment hardware and software. Its achievements include development of communication and meteorological payloads for INSAT and camera payloads for IRS satellites. SAC provides its infrastructure to conduct training courses to the students of CSSTEAP. SAC has three campuses; two are located at Ahmedabad and one is located at Delhi (for further details see website: [www.sac.gov.in](http://www.sac.gov.in)).



## Indian Space Research Organisation (ISRO)

Government of India set up Space Commission and Department of Space (DOS) in June 1972. Indian Space Research Organisation (ISRO) under DOS executes Space programmes through its establishments located in different places in India. The prime objective of ISRO is to develop space technology and its application to various national tasks. ISRO has established two major space systems, INSAT for communication, television broadcasting and meteorological services, and Indian Remote Sensing Satellites (IRS) system for resources monitoring and management. ISRO has developed two satellite launch vehicles, PSLV and GSLV, to place INSAT and IRS satellites in the required orbits (for further details see website: [www.isro.gov.in](http://www.isro.gov.in)). ISRO has also embarked upon inter-planetary missions and has successfully completed the Moon Mission called Chandrayan. It has also launched a satellite to Mars in November 2013, which is likely to reach Mars in September-October 2014,



**IMPORTANT NOTE** (Please read carefully):

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 and if this information is hidden or found during the course, the centre will be compelled to send the candidate back home at his 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 following address.
6. 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. That in case of the violations of the rules appropriate disciplinary action may be taken by the authorities as deemed appropriately, if needed it will be conveyed to your sponsoring organization and your Embassy in India

**To:**

Course Director, NAVSAT-2014  
Space Applications Centre, ISRO,  
Department of Space, Govt. of India,  
Ambawadi Vistar P.O.,  
AHMEDABAD – 380 015 – Gujarat (INDIA)  
Phone : +91 – 79 – 2691 2427/6068  
Fax : +91-79-2691 5821, +91-79-26915807  
Email : cssteapsatcom@sac.isro.gov.in  
Website : www.cssteap.org

**IMPORTANT DATES:**

Last date for receipt of Application Form	: March 15, 2014
Information of selection	: May 10, 2014
Commencement of the Training Course	: June 16, 2014
Completion of the Training Course	: July 11, 2014





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

APPLICATION FORM FOR THIRD INTERNATIONAL TRAINING COURSE ON NAVIGATION AND SATELLITE POSITIONING SYSTEM (JUNE 16, 2014 TO JULY 11, 2014)

at Space Applications Centre, Ahmedabad, India



NAVSAT-2014 (For office use only)

Application No.....

Date Received.....

Important:

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

(Please type or write in CAPITAL LETTERS)

- 1. Name; (as mentioned in the passport) Dr./Mr./Ms./.....
2. Father's Name:..... 3. Name of mother/husband/wife.....
4. Date of birth (DD/MM/YYYY)...../...../..... 5. Place of birth including country:.....
6. Gender (Male/Female)..... 7. Nationality.....
8. Your contact details: Present official address of your organization/ contact number (Please give complete phone number(s), Fax etc. with country and city codes)

Office (Tel.).....Office (Fax):.....

Mobile:.....E-mail:.....

Important:

- a) Interested persons may detach last 4 pages from this brochure and use them as Application Form.
b) It is essential that full passport details are mentioned in the Application Form. Application Forms without passport details may not be considered.
c) Providing alternate email-id, phone will ensure timely communication with applicants, especially during urgency/emergency.
d) 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 arrangements).
e) Please send an advance copy of the application form duly signed by the nominating or sponsoring agency to the Course Director, NAVSAT-2014, Space Applications Centre, Ahmedabad, India either by fax (+91-79-26915807) or scanned copy via email (cssteapsatcom@sac.isro.gov.in) for quick processing. Original copy needs to be sent through Indian Embassy/High Commission in your country after duly signed by the nominating or sponsoring authority.

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9. Your permanent home address in your country/ contact details. (Please give complete phone no. with country and city codes)

.....  
 .....  
 .....  
 Home (Tel.)..... Home (Fax)..... Mobile.....  
 E-mail (alternate, preferably Gmail or Yahoo).....

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

11. ACADEMIC QUALIFICATIONS (mandatory)\*

Degrees (Bachelor/Master/ Diploma)	Duration of Course (mention from which year to year)	University/ Institution	Year of Passing	Grade/ percentage	Major Subjects/ specialization

\*(Enclose copies of Degree(s)/Diploma/Certificates/marks/grades obtained etc. and their certified transcription in English as may be the case)

Major Subject in last examination:..... Area of Specialization.....

Proficiency in English:..... Medium of instruction/language.....

TOEFL Score.....

Reading Fair/Good/Very Good

Writing Fair/Good/Very Good (Please tick (✓) the options)

Spoken Fair/Good/Very Good

Please enclose certified copies of marks/grades of degree, diploma, TOEFL (validity period), etc certificates and their certified translations/transcription in English).

12. DETAILS OF EXPERIENCE AND EMPLOYMENT

(a) Present Position..... Present Responsibilities\*.....

Date of joining present Organization dd/mm/yyyy).....

\*Attach additional sheets giving details of your technical activity during last one year, if necessary.

(b) Experience during past 15 years:

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



13. (a) Activities & important projects in which your present organization is engaged (mandatory) and nature of work done or will be done

.....  
 .....  
 .....

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

.....  
 .....  
 .....

14. Have you done any other course from CSSTEAP (If yes, please give details including theme, registration number and year).

.....

15. Please describe below as to how this course will help you in your work/organization?

.....  
 .....

16. DETAILS OF PASSPORT: Passport details are essential for selection of candidates and send copy of the passport wherever available. If valid passport is not available at present, then copy of the passport needs to be sent at the earlier or before the last date of submission of applications.

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) My blood Group is : ..... (please attach a certificate from a recognized hospital).

(b) Are you suffering from any recurring/chronic/serious communicable disease which may affect your study program in India? Candidates are advised to attach medical fitness certificate from a government hospital or government recognized hospital on hospital letter head for HIV, yellow fever, complete blood test, urine test, blood group, migraine, dental infection, for T.B. chest X-ray, etc.

c) If yes, please specify nature of illness.....

d) If necessary you may be asked to undergo necessary medical tests on your arrival, and if participant is found medically unfit then he/she will be asked to return to his/her country and cost of travel will have to be paid either by the sponsoring/nominating organization or by the candidate.

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 arrangement/ are fully financially or partially sponsored)

.....

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. I have made / am making/have not made travel arrangements for attending the course and local expenses for the period of stay in India (please tick appropriately).

Date:  
Place:

Signature of the candidate

20. CERTIFICATE FROM NOMINATING OR SPONSORING AGENCY

Mr./Ms.....working in this organization is nominated/ sponsored (partly or fully) by.....(Ministry/ Department) to attend the short course on Navigation and Satellites Positioning Systems to be held at Space Applications Centre, Ahmedabad, India during June 16, 2014 to July 11, 2014. We envisage to utilize his/her experience in specific tasks of our organization/agency/institution. The candidate will not be dismissed from the his/her job/service while he/she is attending CSSTEAP programme.

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

Date:.....	Signature:.....
Place:.....	Name in Capital Letters:.....
	Designation:.....
	Phone No:.....
	Fax No:.....
	E-mail:.....
(Official seal of the nominating/ sponsoring authority)	
Note: Application without official seal of nominating/ sponsoring authority and the contact details will not be considered.	

21. FORWARDING NOTE BY THE RESPECTIVE INDIAN EMBASSY/HIGH COMMISSION IN YOUR COUNTRY

This is to forward the application of Mr./Ms.....of.....(Specify the Country name here) for the four weeks course NAVSAT of CSSTEAP, to be held at Space Applications Centre, Ahmedabad, India, during June 16, 2014. to July 11, 2014.

Date:..... Signature:.....  
Place:..... Name:.....  
Designation:.....  
Phone No.:.....  
Fax No.:.....  
Email:.....

(Official Seal of the Embassy/High Commission of India)

IMPORTANT

- The Application which is not complete in all respects is likely to be rejected.  
Smoking and consuming alcoholic drinks in class room and office campus is strictly prohibited.  
Candidates must attach copies of certificates of:
- Medical fitness to attend the course including Chest X-ray (PA), Blood Test (including Random Blood Sugar, HIV, HBs, Ag, Urine complete, TB, Dental infection etc. (in case any medical information requiring attention and long hospitalization is hidden and if found during the course, the centre will be compelled to send the candidate back home country).
  - Educational qualification and the highest degree obtained (Certificate/Degree and/or marks sheet/grade card).
  - Proof of Proficiency in English needs to be provided.
  - Educational and Degree Certificates, if not in English, may please be translated in English and attested by the Head of the organization or transcript in English needs to be submitted.



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Completion of the Training Course : July 11, 2014





#### Headquarters

IIRS Campus  
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Fax: +91-135- 2740785  
Email: cssteap@iirs.gov.in  
Website: www.cssteap.org

#### IIRS Campus

Indian Institute of Remote Sensing  
No. 4, Kalidas Road  
Dehradun- 248 001 (INDIA)  
Tel: +91-135-2744 583  
Fax: +91-135-2741 987

#### SAC Campus

Space Applications Centre  
Ambawadi Vistar, P.O.  
Jodhpur Tekra  
Ahmedabad- 380 015 (INDIA)  
Tel: +91-79-2691 3344  
Fax: +91-79-2691 5843

#### PRL Campus

Physical Research Laboratory  
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Ahmedabad- 380 009 (INDIA)  
Tel: +91-79-26314769  
Fax: +91-79-2630 2275

#### ISAC Campus

ISRO Satellite Centre  
Vimanpura Post  
Bengaluru- 560017 (INDIA)  
Tel: +91-80-25205252  
Fax: +91-80-25205251

#### Delhi Office

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Lok Nayak Bhawan  
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New Delhi- 110 003 (INDIA)  
Tel: +91-11-2469 4745  
Fax: +91-11-24693871

