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差出人　George Maeda

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Attachment(s):
(1) "8_PG_SAS_Brochure", 3.3 MB pdf, 24 pages.

: Re:
: A N N O U N C E M E N T
: 8th Post Graduate Course in
: Space and Atmospheric
: Science.

Dear ISWI Participant:

Please see an important announcement from CSSTEAP
-- Centre for Space Science and Technology Education
in Asia and the Pacific. I attach it as a 24-page pdf.
Includes application form.

This centre is affiliated to the United Nations. And the
request to circulate this pdf came from the UN.

Please forward to persons who may be interested in
taking this course.

Best Wishes for the New Year from Kyushu,
: George Maeda
: The Editor
: ISWI Newsletter

CENTRE FOR SPACE SCIENCE & TECHNOLOGY EDUCATION IN ASIA AND THE PACIFIC (CSSTEAP)

ANNOUNCES

8th Post Graduate Course in Space and Atmospheric Science

Physical Research Laboratory
Ahmedabad, INDIA
URL:www.prl.res.in

ACADEMIC YEAR
2012 - 2013

CENTRE FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION IN ASIA AND THE PACIFIC (CSSTEAP)
(AFFILIATED TO THE UNITED NATIONS)
IIRS CAMPUS, 4 Kalidas Road,Dehradun
URL: *www.cssteap.org*

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India

Cover Page Picture: Earth as seen by Terrain Mapping Camera onboard Chandrayaan I, March 25, 2009: Courtesy Space Applications Centre (SAC)

CSSTEAP

CONTENT

CSSTEAP

INTRODUCTION

Space technology plays a very important role in improving the quality of life of today's human society for information and decision making. Most noticeable 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 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 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 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 four regional Centres established are: Asia and the Pacific (India), Latin America and the Caribbean (Brazil and Mexico) and Africa (Morocco, Nigeria). All of these Centres are affiliated to the United Nations through UN-OOSA. A fifth Centre in Western Asia (Jordan) will be established in the future.

ABOUT REGIONAL CENTRE FOR ASIA AND THE PACIFIC IN INDIA

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 the Centre of Excellence. 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. For conducting its Remote Sensing & GIS programs the Centre has arrangements with IIRS as a host institution. The Centre has also arrangements with Space Applications Centre (SAC) Ahmedabad, playing as host-institution for programs related to Satellite Communications, Satellite Meteorology and Physical Research Laboratory (PRL) Ahmedabad for Space and Atmospheric Science.

The Centre has been imparting education and training, helping participants in developing research skills through its Master Degree, Post Graduate and Certificate programs. 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 programs aim at capacity building for participating countries, in designing and implementing space-based research and application programs. The Centre also fosters continuing education to its alumni.

CSSTEAP Headquarters at Dehradun

"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 program of the Centre is oriented towards the dissemination of knowledge in relevant aspects of space science and technology. The emphasis of the Centre is to deliberate on education and research in the field of space science with emphasis on theoretical studies and hands on experience on state of art instrumentation, continuing education and awareness and appraisal programs. The curriculum has been developed under the auspices of the UN Office for Outer Space Affairs (UN-OOSA) and the guidelines emerged from the meetings held for Education Curriculum Development for the Centre at Granada, Spain in February/March 1995. These curricula are reviewed periodically by an International Advisory Committee. The activities of the Centre are guided by a Governing Board, Academic Council 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.

If desired by the candidate then candidate can submit one year research project to Andhra University, Visakhapatnam, India for Master's Degree (M. Tech. Degree). The eligibility criteria of the university will apply.

(i) Post Graduate Programme: P.G. Courses of nine months duration are organised in the following disciplines:

- Remote Sensing and Geographic Information System (RS and GIS) (at IIRS, Dehradun)
- Satellite Communications (SATCOM) (at SAC, Ahmedabad)
- Satellite Meteorology and Global Climate (SATMET) (at SAC, Ahmedabad)
- Space and Atmospheric Science (at PRL, Ahmedabad)

Core Modules (Semester I and II) emphasize on the development and enrichment of the basic knowledge and skills of the participants in the field of space science and technology. This is followed by pilot project, which provides an opportunity to fine-tune the skills for carrying out research in space science.

CSSTEAP

Prof Kazuo Shiokawa

Pilot project viva

CSSTEAP

Space science 7 participants with diploma

PRL Library

(ii) Master's Programme: This programme gives an opportunity and continuity in developing higher research skills for those who have completed successfully the nine months P.G. Course. This is subject to qualifying for admission requirements of Andhra University, India. A research project by the scholars is conducted and executed in their respective countries 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.

(iii) Short Courses: Besides P.G. level courses, the centre also conducts short term courses of four weeks duration in specific themes of above subjects regularly.

RECOGNITION OF MASTER'S PROGRAMME

The Centre is in agreement with Andhra University (est. 1926) Vishakhapatnam, India for award of M. Tech. Degree. The terms and conditions of this agreement are reviewed from time to time. A few meritorious students of P.G. Course are also considered for award of additional fellowship of six months to one year to complete part of their research work at Centre's host institutions in India which may lead to a M. Tech. Degree of Andhra University.

PROGRAMS CONDUCTED

The Centre has so far conducted 36 post graduate courses, 15 on RS & GIS, seven each in SATCOM, SATMET and Space and Atmospheric Science. The centre has also conducted 24 short Courses/Workshops in the last 16 years. These educational programs have benefited 994 participants from 31 countries in the region and 28 participants from 17 countries outside Asia Pacific region. Sixteenth RS & GIS course at IIRS Dehradun and eighth SATCOM course at SAC Ahmedabad are in progress.

NEXT COURSE	:	**8th P. G. Course in Space and Atmospheric Science**
Duration	:	August 1, 2012 to April 30, 2013
Venue	:	Physical Research Laboratory, Navrangpura, Ahmedabad 380 009, INDIA
Number of seats	:	15
Last date of receipt of applications	:	March 01, 2012

IMPORTANT DATES

Last date for Receipt of Applications	:	March 1,2012
Information of Selection	:	April 30, 2012
Commencement of Course	:	August 1, 2012
Completion of Phase-I (in India)	:	April 30, 2013
Admissions in M. Tech	:	April, 2013

Since the number of seats are limited, applicants are advised to process their applications well in advance of the last date.

WHO CAN APPLY?

The course is designed towards the scientists, teachers, professionals and specialists of the Asia Pacific region, working in the field of space science and allied fields, who wish to improve their skills in the field of Space and Atmospheric Science, and thereby improve their usefulness to their parent Institutes/Organizations.

It is strongly expected that the participating scholars will be able to:

- Serve as catalysts for furthering the skills and knowledge of other professionals in their countries.
- Enhance the self reliance of their respective countries so as to lessen dependence on external experts.

HOW TO APPLY?

Applications are invited from candidates in countries of Asia and the Pacific Region for the 8th P. G. Course in Space and Atmospheric Science. All the candidates need to be sponsored (i.e. endorsed) by recognized institutions (e.g. ministries or universities in their respective countries). Sponsoring institutions/authority should ensure that on return, the scholar will be given opportunity to work 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 and it is assumed that sponsoring authority will facilitate one year research project in the home country. However, the Centre will provide long distance technical guidance. A limited number of short and long term fellowships may be made available to meritorious participants to complete Phase II Research Project work in India.

Please submit the duly filled application form through the CSSTEAP Governing Board member of your country to the Indian Embassy/High Commission in your country (For list of the members please see inside of the front cover page). However, the applicants from non-Governing Board Member countries need to submit completed application forms to the Centre through the Embassy/High Commission of the respective country in New Delhi, India. 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, the same may be translated in English and certified by the Head of the organization or provide English transcription of all such documents. However, an advance copy may be forwarded at the following address for advance action and follow-up at this end:

The Course Director
Space Science
Physical Research Laboratory,
Navrangpura, Ahmedabad 380 009, INDIA

Telephone # +91-79-26302275
Fax # +91-79-26302275
E-mail uncsc@prl.res.in

Note: Those who are applying for TCS fellowship shall also include a copy of the duly completed form submitted to the Embassy/High Commission of India in their country.

At USO Udaipur

Dr. Nandita Srivastava

CSSTEAP

PRL main Campus

Space Science 7 participants with Prof. J N Goswami Director PRL

To download application form or to know more about CSSTEAP, its past and future programmes, participants and countries who have benefited from these and the Pilot Projects carried out through these programmes, please visit us at www.cssteap.org

ELIGIBILITY FOR ADMISSION

The prospective participants should possess a Masters Degree in Physics or other equivalent qualification relevant to Space and Atmospheric Science, OR Bachelor's Degree in Engineering, (B.E./ B. Tech.) in Electronics and allied fields / Environmental Science/Engineering. Candidates having teaching or research experience would be preferred. Candidates possessing higher qualifications viz. a Ph. D., would also be eligible for admission.

Important
The applicants are advised to bring original documents for verification at the time of reporting in India.

SELECTION PROCEDURE

The Centre will select the candidates through a well laid procedure, which includes satisfying academic eligibility, proficiency in English language, funding/forwarding by sponsoring authority/organization, country representation, etc. Only selected candidates will be intimated by 30th April 2012 and list of selected candidates will also appear at Centre's web-site (www.cssteap.org). Preference in selection will be given to those candidates whose expenses are borne by the candidate / sponsoring agency. Once a candidate has been sponsored and admitted, the sponsoring authority/organization or candidate need to inform at least 15 days in advance for withdrawal or cancellation of the candidature. If the sponsoring authority wishes to call back its candidate after joining the Centre or in the middle of the course, the travel cost need to borne by either sponsoring authority or by the candidate itself.

ABOUT HOST INSTITUTE

Physical Research Laboratory

Physical Research Laboratory (PRL), founded in 1947 by Dr. Vikram Sarabhai, is a premier scientific institution under the Department of Space Government of India. As is very well depicted in its logo, PRL research encompasses the earth, the sun immersed in the fields and radiations reaching from and to infinity ,all that man's curiosity and intellect can reveal. The research activities are multi-dimensional and cover Astronomy and Astrophysics, Solar Physics, Planetary Sciences and Exploration, Geosciences, Space and Atmospheric Sciences and Theoretical Physics. PRL has four campuses –the main campus is at Navarangpura, Ahmedabad and the others are at Thaltej, Ahmedabad, the infra – red observatory at Gurushikhar, Mount Abu, and the Udaipur Solar Observatory at Udaipur. PRL is contributing significantly to the scientific manpower development through Doctoral (Ph.D.) and Post-Doctoral programmes, Associateship Programme for university teachers, Summer Programme for M.Sc. students and college teachers and Project Training of Engineering, MCA and Diploma students. PRL alumni have played a key role in building and contributing to the development of other institutions in the country. The Indian Space Research Organization (ISRO) was nucleated in PRL in the early seventies. Two of the past Chairman of ISRO - Professor U.R. Rao and Dr.K. Kasturirangan - are alumni of PRL. For further details you may visit PRL website: http://www.prl.res.in

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FACULTY

The faculty for the course constitutes experts in different fields drawn from the Physical Research Laboratory, Ahmedabad, a number of ISRO Centres and various research institutes and universities in India and abroad. The core faculty has a strong scientific background with a number of publications, experience of participating in international scientific programs, organizing a number of courses / workshops / symposia, etc. to their credit. A few visiting international experts will also be invited to deliver special lectures.

MEDIUM OF INSTRUCTIONS

The medium of the instructions/teaching is English. Proficiency in written and spoken English is most essential. 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.

TEACHING METHODS AND FACILITIES

Modern facilities exist at the Centre for class-room teaching and practical instructions/demonstrations. Printed as well as digital course material of the lectures is supplied. The teaching methods include class room lectures, video lectures, computer based training packages, laboratory experiments, group discussions, demonstrations, and seminar presentations.

Physical Research Laboratory, Ahmedabad is a premier institution of space research in India. A number of sophisticated experiments like digital ionosonde, high power lidar, optical instruments for photometry, spectrophotometry and imaging of day/night airglow emissions, instruments for surface/in-situ measurements of ozone, aerosols, trace gases, conductivity, electric fields in the middle atmosphere and of electron density, ion-neutral composition and electric fields in the ionosphere, form the backbone of the current space research activities.

PRL has also acquired highly sophisticated experimental facilities such as the Ion Probe, Stable Isotope Mass Spectrometer, Gas Chromatographs and a state of the art Thermal Ionization Mass Spectrometer (TIMS) for studies in Planetary and Geosciences. A nano-SIMS and a Noble Gas Mass Spectrometer have been commissioned. These instruments are capable of measuring isotopic ratios of different elements very precisely, and will help to study solar system, planetary and geological evolutionary processes and their time scales. A state-of-the-art Isotope Ratio Mass Spectrometer has been set up under IWIN project, which can measure the isotopic ratios of heavier and lighter isotopes.

For astronomy and Solar Observations, two dedicated Observatories, one operating in Infra-red and other in visual bands are there at Mount Abu and Udaipur, respectively. An ambitious research plan for the next five years has been drawn up and Space based experiments in Astronomy, Atmospheric and Planetary sciences are proposed. Computer facilities include a number of high power workstations with a large number of PCs connected through network with connectivity to Internet. PRL hosts an excellent library with a large collection of books and periodicals in varied fields of Space and Atmospheric Sciences.

Late Prof. Tom Gehrels

Laboratory Session

Space Photochemistry Lab

Seminar Presentation

Infra-red Observatory, Mt. Abu

Nano SIMS Laboratory

EDUCATIONAL VISITS

As a part of the course curriculum, the participants will have the opportunity to visit different centres of ISRO / Dept. of Space, Govt. of India and other organizations concerned with space research.

PEFORMANCE EVALUATION

The performance of the participants is assessed through written, interactive-sessions and/or computer-assisted practical exercises. Independent assessments of theory exams are conducted by external and internal faculty. However, the practical examination is conducted jointly. The participants need to pass each examination paper. Participants, who fail to qualify in the examinations in the nine 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 study, i.e. nine-months course, the participants will be awarded Post Graduate Diploma. Certificate of Attendance will be given to the candidates who fail to qualify. If the participant is able to complete Phase-II Project work, i.e. research project in home country satisfactorily within four years thereafter the work can be submitted to the Andhra University (India) for award of M. Tech. Degree.

COURSE EXPENSES

The overall expenses of the course are given below, this is besides the international travel (to and from city of the course participant to course venue):

- Course Fee : US $ 6000 per participant
- Local tours : US $ 1200 per participant
- Living expenses : US $ 1100 per participant

The participants are expected to find suitable sponsorships or funding for meeting the expenses while attending the course in India.

FINANCIAL ASSISTANCE TO PARTICIPANTS FROM GOVERNMENT OF INDIA

For this course, Government of India (GOI) has offered to bear the course fee of US $ 6000 per participant from the Asia-Pacific region to the selected candidates by the Centre. Thus no course fee is payable by the selected participants from the Asia-Pacific region. GOI will provide financial assistance as mentioned below:

Living expenses in India	:	INR 16,000 per month for the duration of 9 months.
Book allowance	:	INR 2,000 per annum
Project allowance	:	INR 1,500 per annum
Local tour 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 and Social Commission for Asia and the Pacific (UN-ESCAP). UN-ESCAP has been supporting over the years to the CSSTEAP education programmes and has extended travel grants to a good number of CSSTEAP course participants since its inception. This contribution by UN-ESCAP is highly supportive to the overall CSSTEAP activities.

FINANCIAL ASSISTANCE TO CANDIDATE THORUGH TCS

This course is approved by the Ministry of External Affairs. Government of India under its TCS of Colombo Plan Fellowship for the foreign nationals from Afghanistan, Bangladesh, Bhutan, Fiji, Indonesia, Iran, Republic of Korea, LAO PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand and Vietnam. The fellowship covers to and fro international travel and other training related expenses. The applicants from the above countries are encouraged to apply for TCS Fellowship. The details of this fellowship and prescribed application form may be obtained from the Embassy/High Commission of India in the home country of the candidates and duly completed form need to be submitted to them. Simultaneously, they are required to send their biodata on the CSSTEAP prescribed application form, appended in the announcement brochure, to Director CSSTEAP, along with a copy of duly completed TCS fellowship form submitted to Embassy/High Commission of India in their country.

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.

INSURANCE

Medical, life and disability insurance should be undertaken before leaving their country for India by all 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. 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 limited liabilities as far as medical expenses are concerned in such cases. Candidates in sound physical and mental health only need to apply.

In case if any information requiring medical attention is hidden and if found during the course, the centre will be obliged to send the candidate back home any time. The travel cost will be borne either the sponsoring authority or by the candidate itself.

LIFE AT CENTRE

Accommodation will be arranged in international hostel with good living facilities for Participants only. This gives an opportunity for participants to interact and share their knowledge and cultural values. Accommodation on single occupancy basis is provided to all the selected participants. The campus is equipped with good living facilities, like independent kitchenette, gymnasium, tennis court, etc. A sum of INR 1500/-per month is to be paid by the participant towards the accommodation. Boarding and other expenses are to be borne by the participants themselves. Since India is country of festivals, the participants get to know about different colourful festivals throughout the year.

SPACE AND ATMOSPHERIC SCIENCE COURSE AT A GLANCE *

(* For details see Annexure I)

The phase I of the Space and Atmospheric Science Course, which is of nine month duration is organized in two semesters of 20 & 19 weeks each. This has been done to conform to pattern followed by Andhra University Visakhapatnam. There are four theory papers

At Gong USO Udaipur

Space Science 7 Group at Lalbaug ,Bengaluru

International Hostel Campus

Hostel Room

In the hostel kitchenette

alongwith six laboratory experiments in the first semester, and two theory papers, six more laboratory experiments and pilot project in the second semester. Introductory lectures on topics overing all the branches of space science and technology are taken in the beginning of the course for about one or two weeks. These topics together form common module.

Semester I : 20 Weeks, 4 papers of 200 Marks each
(50 periods of 60 minute duration)

Paper 1 SAS.101	Structure, Composition and Dynamics of Planetary Atmospheres
Paper 2 SAS.102	Ionospheric Physics
Paper 3 SAS.103	Measurement and Data Analysis Techniques
Paper 4 SAS.104	Basics of Space Technology

Experiments[Any 6 from the specified list]

Semester II : 19 Weeks, 2 papers of 200 Marks each and Pilot Project

Paper 5 SAS.201	Introduction to Solar Physics, Magnetospheric Physics and Space Weather
Paper 6 SAS.202	Astronomy and Astrophysics
Pilot Project SAS. 203	

Experiments [Any 6 from the specified list]

Common Module

- Properties of Electromagnetic Spectrum
- Orbits and Platforms
- The Universe
- Ionosphere
- Solar Activity
- Earth's Atmosphere
- Meteorological Satellite Applications
- Global Climate and Climate Change
- Evolution of Communication Satellites
- Elements of Satellite Communications Systems
- Satellite Communications Link and Propagation Effects
- International Regulations
- Applications and Trends in Satellite Comunications
- Basic Principles of Remote Sensing
- Data Reception and Data Products
- Geographic Information System (GIS)
- Applications of Remote Sensing
- Space Law

PHASE II: ONE YEAR PROJECT

Each participant 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 supervisor at the Centre in an area relevant to the interest of the sponsoring institution / country. The sponsoring institution/country is obliged to guarantee on the return the 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. This course programme will be considered complete on acceptance/ approval of the submitted project report.

ABOUT THE CITY

Ahmedabad is named after Sultan Ahmed Shah who founded this city in 1411 AD and graced it with splendid monuments. It is a great textile and commercial centre and was called the 'Manchester of India' in the past. Ahmedabad is today a prosperous, thriving city, the second largest in western India. The pre-Mughal Muslim Sultans of Gujarat embellished it with mosques and mausoleums in mellow, honey colored sandstone to create the Indo-Saracenic style of architecture - a rare and happy blend of Muslim and Hindu styles. 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 Makarasankranti (January 14) and the color festival of Holi (March) are occasions to enjoy.

Ahmedabad is associated with Mahatma Gandhi, the apostle of peace and nonviolence whose Ashram or retreat, on the banks of the river Sabarmati is now a place of national pilgrimage. It is also the home of many premier academic and cultural institutions, mainly due to the vision of Vikram A. Sarabhai, who was the founder of PRL. Prominent among them are Ahmedabad Textile Industries Research Association, National Institute of Design, Indian Institute of Management, Institute of Indology, Vikram Sarabhai Community Science Centre and Darpana Academy of Performing Arts apart from PRL and Space Applications Centre (SAC). The city is well connected by rail, road and air with all major cities in India. There are daily air services from Delhi, Mumbai, Chennai, Kolkata and Bengaluru . PRL is situated about 8 km from railway station and about 15 km from the airport.

Weather of Ahmedabad

The weather of Ahmedabad is predominantly warm throughout the year except for brief cold spell during second half of December and the month of January, when minimum temperatures may go to 4-6° Celsius for a few days. Light woolens are advised during this period.

Rainfall

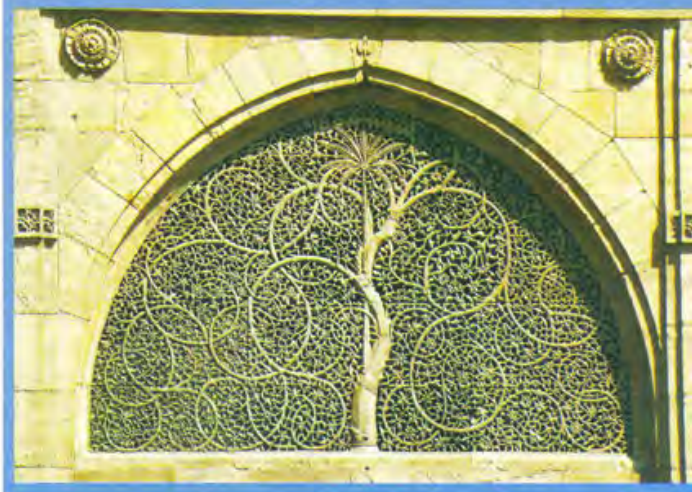
Annual Average	:	780 mm (mostly during 15 June - 15 September)
Highest	:	1997 mm in the year1927
Lowest	:	214 mm in the year 1918

Temperature

Highest	:	47.8°C on 27th May, 1916
Lowest	:	2.2°C on 6th February, 1920

Alumni Meet

Alumni meets were organized to develop a network and to establish meaningful linkages between CSSTEAP, faculty and its past students. These were aimed to provide common platform to interact and apprise about the latest development in the space technology and its applications. Such meets were held in Nepal, Bangladesh, Sri Lanka and Bhutan in 2011. These meets took place in Kathmandu, Dhaka, Colombo and Thimphu. The centre proposes to 2-3 such meetings in coming years in different countries.



ANNEXURE-1

Course Contents

Semester I : 20 Weeks, 4 papers of 200 Marks each

(Numbers in parentheses indicate number of periods of 60 minute duration)

Paper 1 SAS. 101 Structure, Composition and Dynamics of Planetary Atmospheres (50)

1.1 Basic concepts of Earth's Atmosphere (10)
Basic Structure of Atmosphere - Hydrostatic Equilibrium - Scale Height - Geopotential Height Thermodynamic Considerations – Elementary Chemical Kinetics – Composition and Chemistry of Lower, Middle and Upper Atmosphere - Thermal Balance in Thermosphere.

1.2 Solar Radiation and its Effects on Atmosphere (5)
Solar Radiation at the Top of the Atmosphere – Attenuation of Solar Radiation in the Atmosphere – Radiative Transfer – Thermal Effects of Radiation – Photochemical Effects of Radiation

1.3 Aerosols, Greenhouse Gases and their effects on Radiation Budget (15)
Aerosols & Radiation Budget - Long Term Climate Impact - Black Carbon & Dust- Greenhouse Gases - Carbon monoxide - Carbon dioxide - Oxides of Nitrogen - Methane – Atmospheric Ozone – Ozone Chemistry – Ozone Hole.

1.4 Dynamics of Earth's Atmosphere (10)
Equation of Motion of Neutral Atmosphere – Thermal Wind Equation – Elements of Planetary Waves – Internal Gravity Waves and Atmospheric Tides – Fundamental Description of Atmospheric Dynamics and Effects of Dynamics on Chemical Species

1.5 Atmospheres of other Planets and Satellites (10)
Inner and Outer Planets – Characteristics of Atmospheric Structure and Composition of Jupiter, Mars, Venus and Saturn and their Important Satellites.

Paper 2 SAS. 102 Ionospheric Physics (50)

2.1 Structure and Variability of Earth's Ionosphere (15)
Introduction - Chapman's Theory of photo-ionization – Continuity equation and photo-chemical equilibrium – Loss processes - á and â Chapman layers - Chemistry of E and F1 regions - D region chemistry – Water cluster ions and their significance - Electron attachment and negative ions in the D region - F region processes – F layer splitting - Vertical transport - Ambipolar diffusion and F2 peak - Topside ionosphere – Diffusion between ionosphere and protonosphere - Morphology – diurnal, seasonal and solar cycle variations of ionospheric regions - F- region anomalies - SIDs

2.2 Ionospheric Plasma Dynamics (15)
Properties of magneto plasma – Gyro frequency - Plasma frequency - Debye length and Frozen in field - Basic fluid equation - Steady state plasma motions due to applied forces - Electrical conductivity of the ionosphere - Generation of electric field and electric field mapping - Ionospheric dynamo - Ionospheric irregularities – Equatorial Spread F and Equatorial Electrojet (linear theories) - Mid-latitude ionospheric irregularities – Sporadic E

2.3 Electromagnetic Wave Propagation in Ionosphere (15)
Theory of Wave propagation - Properties of plane waves in isotropic and anisotropic media - Group propagation - Ray and group velocities - Radio waves in ionized media – Propagation in isotropic plasma and refractive index - Concepts of critical frequency and virtual height - Magnetoionic theory – Appleton-Hartree formula for refractive index - Ordinary and extraordinary waves - Reflection conditions - Deviative and nondeviative absorption formulas - Oblique incidence propagation – MUF and skip distance.

2.4 Ionospheres of other Planets and Satellites (5)
Ionospheres of Mars, Venus, Jupiter, Saturn and Titan

Paper 3 SAS. 103 Measurement and Data Analysis Techniques (50)

3.1 Radio Frequency Techniques (15)
EM radiation - Small dipoles and Loops - Half wave dipole - Antenna Arrays - Reflector Antenna –Applications for Radio Astronomy - Transmission lines and Impedance Matching Techniques - Receivers and Transmitters - Ionospheric Absorption Techniques - Ionosonde - HF and VHF Radars – Coherent and Incoherent Scatter Radars (HF, VHF and MST) - Radio Beacon Techniques - Global Positioning System (GPS),

3.2 Optical Techniques and Airglow (15)
Photomultipliers Tubes - Image Intensifiers – Lasers - Semiconductor Photonic Devices - Photo diodes - Avalanche diodes - Laser diodes - CCD & CMOS imaging detectors — Imagers - Interference Filters and Etalons – Fabry Perot Interferometer - Filter Photometers – Lidar - Airglow – Oxygen green and red line emission - Nightglow – Dayglow – Twilight Glow — Applications of Airglow Measurements for Ionospheric Dynamics

3.3 In Situ Techniques on Space Platforms (10)
Langmuir Probe – Electric Field Probe – Ion Drift Meter – Retarding Potential Analyzers – Mass Spectrometers and Magnetometers – Satellite based temperature measurement - Satellite Drag for Neutral Densities - Measurement of Aerosols, Trace Gases and Ozone

3.4 Data Analysis Techniques (10)
Error analysis - Time series – Fourier Transform – DFT – FFT –Least Square Method – Linear Fitting – Statistical test of Significance – Correlation – Chi Square Test.

Paper 4 SAS. 104 Basics of Space Technology(50)

4.1 Launch Vehicles, Satellites and their Orbits (5)
Principles of Rocketry - Rocket Motors - Solid and Liquid Fuel Rockets - Sounding Rockets - Cryogenic engines - Multistage Rockets - Satellite Launch Vehicles - Basics of Satellite orbits- Kepler's Laws – Sub-satellite Point – Orbital Parameters – Sun-synchronous and geosynchronous Orbits – Low-Earth Orbits

4.2 Attitude Control, Power and Thermal systems of Spacecrafts (15)
Attitude Sensors – Sun Sensors – Star Sensors – Earth Sensors – Magnetic Aspect Sensors- Accuracy – Spin Stabilization and Gyros – Control of Flight-path – Close-loop Guidance, Spacecraft Power System –Solar Cells and Panels – Primary and Secondary Batteries— Special Power Sources – Radioactive Thermoelectric Generators (RTG), Spacecraft thermal control techniques

4.3 Selection of Materials for Space –borne payloads (10)
Behavior of Materials in Space (Temperature, Pressure and Radiation) – Outgassing —Corona Discharge— Coating and Coating-compounds – Radiation Damage –,Mounting of Subsystems – Structural and Mass Limitations – Carbon Fiber Reinforced Plastic (CFRP) - Honeycomb Structures —Effects of Vibrations and Shocks on Spacecraft Structures – Spacecraft Thermal Environments – Thermal Paints and Surface Finish.

4.4 Reliability, Tests and Qualification of Payloads for Space Experiments (5)
Fabrication of Electronics – Subassemblies- Electromagnetic Compatibility—Checkout, Reliability Considerations and derating - Test and Evaluation - Thermovac tests - Vibration and shock tests

4.5 Telemetry, Tracking, Command (TTC) and Data Handling System (5)
Telemetry System – Signal Conditioner, Onboard Data Recorder, Telecommand – Encoder—Decoder—Pulse and Data Commands - RF Systems – Receivers, Transmitters and Antenna— Ground Segments – Real-time and Off-line — Tracking

4.61 Examples of Remote Sensing, Weather and Communication satellites (4)
Discussion of some Indian and foreign operating remote sensing satellites and their instruments - Vital instrument parameters and sensitivity of instruments - Examples of communication satellites and their instruments - limitations and sensitivity of instruments

4.62 Science Satellites (6)
Discussion of instruments and their capabilities on Atmospheric Science satellites like ENVISAT, Megha-Tropique - Instruments and sensitivities of Astronomy satellites – Hubble Space Telescope, Spitzer Observatory - Chandra X-ray Observatory, Rossi X-ray Timing explorer - Astrosat and Swift mission

Experiments [Any 6 from the following]

1. Plasma Characteristics by Langmuir Probe
2. Ionospheric Sounding using an Ionosonde
3. Surface Monitoring of Ozone
4. Multiwavelength Airglow Photometer
5. Study of Ionospheric Scintillations
6. Characterization of Interference Filters
7. Optical Depth Measurement Using Filter Photometer
8. Balloon borne measurements of Atmospheric Ozone
9. Total Electron Content measurements using GPS receiver
10. Measurements of Aerosols by Micro pulse Lidar
11. Airglow Imaging at Mount Abu
12. Photoionization studies using Recoil Ion Momentum Spectrometer

Semester II: 19 Weeks, 2 papers of 100 Marks each ,and Pilot Project

Paper 5 SAS. 201 Introduction to Solar Physics , Magnetospheric Physics and Space Weather (50)

5.1 Origin of Magnetic Field of Earth and Other Planets (10)
Dipole Description of Geomagnetic Field –Local elements and their determination - Secular and Diurnal Variation of Geomagnetic Field – Determination of Geomagnetic Coordinates of Station — Magnetic Fields of Other Planets.

5.2 Elements of Solar Physics (15)
Sun and its Atmosphere – Solar Magnetic field - Sunspots and Solar Cycles – Solar Flares , Coronal Mass Ejections (CME) and Solar Wind

5.3 Magnetosphere of Earth and Other Planets (15)
Effects of Solar Wind on Planetary Magnetic Fields – Formation of Geomagnetic Cavity – Magnetopause – Magnetosheath and Bow Shock – Polar Cusp and magnetotail – Effect of Interplanetary Magnetic field on Magnetosphere - Plasmasphere and Van Allen Radiation Belts – Magnetotail Dynamics - Substorms , Aurorae and Storms - Magnetosphere of Other Planets

5.4 Space Weather and its Effects (10)
Geomagnetic Storms – Sub-storms and Current Systems – Coronal Mass Ejections – Effect of Magnetic Disturbance on Ionosphere and Thermosphere System - Effects on Space and Ground Based Systems

Paper 6 SAS. 202 Astronomy and Astrophysics (50)

6.1 Introduction to Astronomy (8)
Introduction —Coordinate Systems – Time - Observable quantities - Stellar Parameters –Brightness, Luminosity - Magnitude Scale - Colour - Black Body Temperature - Size.- Distances - Spectrum -Spectral Lines - Formation of Spectral Lines - Saha's Equation)—Spectral Classification—H R Diagram— Binary stars and Stellar Masses and Sizes.

6.2 Solar System Objects and their Exploration (5)
Planets and satellites of the planets and their orbits - Structure and topography of planets and their satellites - Physical and chemical characteristics - Space imagery of planets and their environment - Comets, asteroids and other minor bodied in the solar system - Their orbits, surface and composition - Comet and asteroid collisions

6.3 Introduction to Astrophysics (12)
Star Formation—Molecular Clouds —Stellar Evolution (Main Sequence - Energy Sources - Nuclear Energy for a Star - Energy Transport - Inter Stellar Matter —Dust—Extinction –Stellar Old Age — Planetary Nebulae - White Dwarf,—Death of A Star—Supernovae - Neutron star – Pulsars - Black Hole – Milky Way Galaxy — Hubble Classification of Galaxies.

6.4 High Energy Astrophysical Processes and Phenomenology (10)

Radiation processes - Cosmic Rays – Composition, energy and origin - X-ray Sources - X Ray Binaries - Supernova Remnants – Pulsars – Galaxies - Active Galactic Nuclei - Solar X-rays - Gamma –ray astronomy- Gamma-rays from Pulsars - Supernova Remnants and Active Galactic Nuclei - Neutrino astronomy

6.5 Astronomical Instruments and Observing Techniques (15)

Telescopes - Different types of telescopes - Angular resolution and Diffraction Limited Resolution - Image formation in a camera - Plate Scale - Observatories (Ground Based & Space Based) - Focal Plane Instruments—Imagers - Photometers - Spectrometers – CCDs and their use in astronomy - Detectors for Optical, Infrared, UV, X-rays, and Gamma-rays - Effect of Atmosphere (Seeing and Scintillation)

Pilot Project SAS. 203

The Pilot Project is to be done throughout, after completion of papers 5 and 6 during Semester-II. Course participants select a pilot project in consultation with their parent institution and a host institution project supervisor. The participants are encouraged to choose topic of interest to their respective home country. The pilot project is supposed to be precursor to the one-year project undertaken by the participant in their home country. This also ensures that the participant can start the research project right away.

Experiments [Any 6 from the following]

1. Light Curve of a Binary Star
2. Interferometric Study of Planetary Nebulae
3. Mass of aerosols using QCM
4. Radio Pulsar Studies using GMRT/OSRT
5. Study of Solar Spectrum (At USO)
6. Charaterization of Fabry Perot Etalons
7. Measuring Energy resolution of CZT detector with X-rays from a radioactive Source
8. Characteristics of a Proportional Counter
9. Measurement of Atmospheric Temperature by Nd Yag Lidar
10. Three Component Atmospheric Wind by MST Radar

Common Module

- Properties of Electromagnetic Spectrum :reflection, refraction, absorption, emission, scattering, polarization – effect of atmosphere on the porpogation of EM radiation and its impact on various applications – fundamentals of radiometry – definition of radiometric quantities.
- Orbits and Platforms :Types of orbits – viewing geometry – types of satellites, main frame subsystems, payloads, GPS
- The Universe : its structure, constituents and origin
- Ionosphere : its structure and role in communication
- Solar Activity : it influences on terrestrial phenomena and space weather
- Earth's Atmosphere: its structure, composition and long term variability, basic meteorological parameters. Land-ocean-atmosphere interaction affecting weather
- Meteorological Satellite Applications : Parameter retrieval, application of Met Satellite – cyclone tracking, weather forecast, agrometeorological service etc.
- Global Climate and Climate Change : Radiation balance, influence of GHG, sources and monitoring of GHG – International Coordination – IPCC.
- Evolution of Communication Satellites : Early days, Passive satellites, Active satellites, Operational systems, Evolution of INTELSAT satellites, Evolution of Earth stations, Evolution of Regional and Domestic satellite systems, Evolution of satellite services, Important satellite operators at present in FSS / MSS / BSS / DAB / B-MBS / Satellite Navigational systems, pros & cons of NGSO / GSO Orbits for communications satellites
- Elements of Satellite Communications Systems: Space segment, Ground segment, network configurations for different services, radio spectrum, Allocations of frequency bands
- Satellite Communications Link and Propagation Effects: Link quality, Link parameters, Satellite communications systems model, Link Budget, Performance of time specifications, Radio wave propagation mechanisms, Radio wave propagation factors, propagation through atmospheric gases, Radio noise in satellite communications
- International Regulations : Radio regulations, Frequency allocations, Frequency assignment steps, Regulations relating to satellite networks, Procedure for applying to non-planned bands, Satellite – terrestrial coordination, GMPCS- MOU, Role of ITU, WTO agreements, Harmonisation of Regulations in Europe
- Applications and Trends in Satellite Comunications : Applications trends, Connectivity trends, Technology trends, Frequency trends, Regulatory trends, User trends, Global market trends
- Basic Principles of Remote Sensing : end to end system concept – concept of signature - remote sensing sensors – overview – optical and thermal, microwave – sensor parameters – past, present and future sensor system.
- Data Reception and Data Products : organization of ground system for data reception, preprocessing – radiometric and geometric correction – special processing – georeferencing, output medium - data analysis – visual image analysis – digital classification, classification accuracy atmospheric effect.
- Geographic Information System (GIS)
- Applications of Remote Sensing: food security, water resources management, environmental monitoring and conservation, inputs for infrastructure development etc.
- Space Law

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

APPLICATION FORM FOR
EIGHTH POST GRADUATE COURSE IN SPACE AND ATMOSPHERIC SCIENCE
(AUGUST 1, 2012 TO APRIL 30, 2013)
AT
PHYSICAL RESEARCH LABORATORY, AHMEDABAD, INDIA

SPACE SCIENCE-8
(For office use only)
Application No_____
Date Received_____

Affix recent Photograph

(PLEASE TYPE OR USE BLOCK CAPITALS)

1. Name: (As mentioned in the passport)
Mr./Ms./Dr._____
First Middle Last
2. Date of Birth(dd/mm/yyyy)_____ 3. Place of Birth_____
4. Sex : M ☐ F ☐ 5.Nationality_____
6. Contact Information: Present Mailing Address (Valid until date_____)
_____
_____
_____
Telephone _____Fax _____
E mail _____
7.Permanent Contact Address (if different from the Present Mailing address)
_____
_____
_____
_____
Telephone(Please give complete phone numbers with all codes)
Home_____ Office_____
Fax_____E mail(alternate preferably Gmail or Yahoo)_____

Important:
1. Last 4 pages from this brochure may be detached and used as Application form.
2. Please give full passport details, else Application may not be considered.
3. Providing Alternate email id would ensure timely communication.

8. Academic Qualifications (In chronological order)*

Degree/ Diploma	Duration of Course	University	Year of passing	Grade/Class	Major Subjects

*(Please enclose copies of Degree/Diploma/Certificates/Marks/Grades obtained etc and transcription in English)

Major Subject & Degree/Diploma Obtained in the Last Examination

_____

Area of Specialization _____

Medium of instruction/language _____ TOEFL Score _____

Proficiency in English: (please tick the option)

Reading Fair/Good/Very Good

Writing Fair/Good/Very Good

Spoken Fair/Good/Very Good

9. Details of Professional Experience during the last five years

9(a) Present Position/ Designation _____

Present Responsibilities _____

_____

_____

Organization and complete Address _____

_____

_____

Date of Joining this Organization(dd/mm/yyyy)_____

9(b) Professional Experience during past 15 years:

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

10(a) Activity & projects in which your organization is engaged (mandatory)

_____

_____

_____

10 (b). Main technical/scientific facilities available in your organization including approximate number and type of computers, type of software available etc.

_____

_____

_____

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

_____

12. Passport Details : (these are necessary to consider admission)

Passport #	Place of Issue	Date of Issue	Date of validity	Issuing Authority

13. Physical Fitness:

a) Are you suffering from any recurring/chronic/serious 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 Hospital or Qualified Doctor)

14. How do you propose to meet the international travel & stay expenses in India?

_____

_____

15. Have you applied for TCS fellowship? If so, enclose a copy of the duly filled application form, submitted to Embassy/High Commission of India in your country. (Applicable for only those candidates who are from the countries for which TCS fellowship is available, as specified under "Financial assistance to participants" in the brochure.)

_____

16. How do you foresee the Post Graduate Course in Space and Atmospheric Science will help you?

_____

_____

17. Declaration by the candidate

I have read the Announcement brochure and will abide by the rules and regulations of the Centre. I have made / am making/have not made travel arrangements for attending the Course, and for local expenses for the period of stay in India.

Date _____

Place _____ Signature of the candidate

18. Sponsoring Agency /Head of the Organization Certificate

Mr./Ms._____is sponsored by _____to attend the 8th Post Graduate Course in Space and Atmospheric Science, to be held at Physical Research Laboratory, Ahmedabad, India during August 1 , 2012 - April 30, 2013. We envisage to utilize, his/her experience in specific tasks of our organization/agency. The candidate will be allowed to carry out a Research Project 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.

a) He/She will be / will not be provided international travel support.
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:_____ Name: _____

Place:_____ Signature: _____

Designation: _____

Phone:_____ Fax:_____

Email:_____

(Official seal of the sponsoring / nominating authority)

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

19. Forwarding Note by the Country's Embassy in India

This is to forward the application of Mr./Ms_____of _____(specify the country name here) for the 9 months Post Graduate Course in Space and Atmospheric Science of CSSTEAP, to be held at Physical Research Laboratory, Ahmedabad , India, during August 1, 2012 to April 30, 2013.

Signature:

Date: Name :

Place: New Delhi Designation:

(Official Seal of the Embassy/High Commission)

N.B. Please send duly signed advance copy of the application forwarded by sponsoring organization, to The Course Director, Space and Atmospheric Science, Physical Research Laboratory, by fax (+91 79 26302275)for quick processing. The original copy of the Application, duly signed by the sponsoring or nominating authority, need to be submitted through Embassy/High Commission of respective country, at New Delhi.

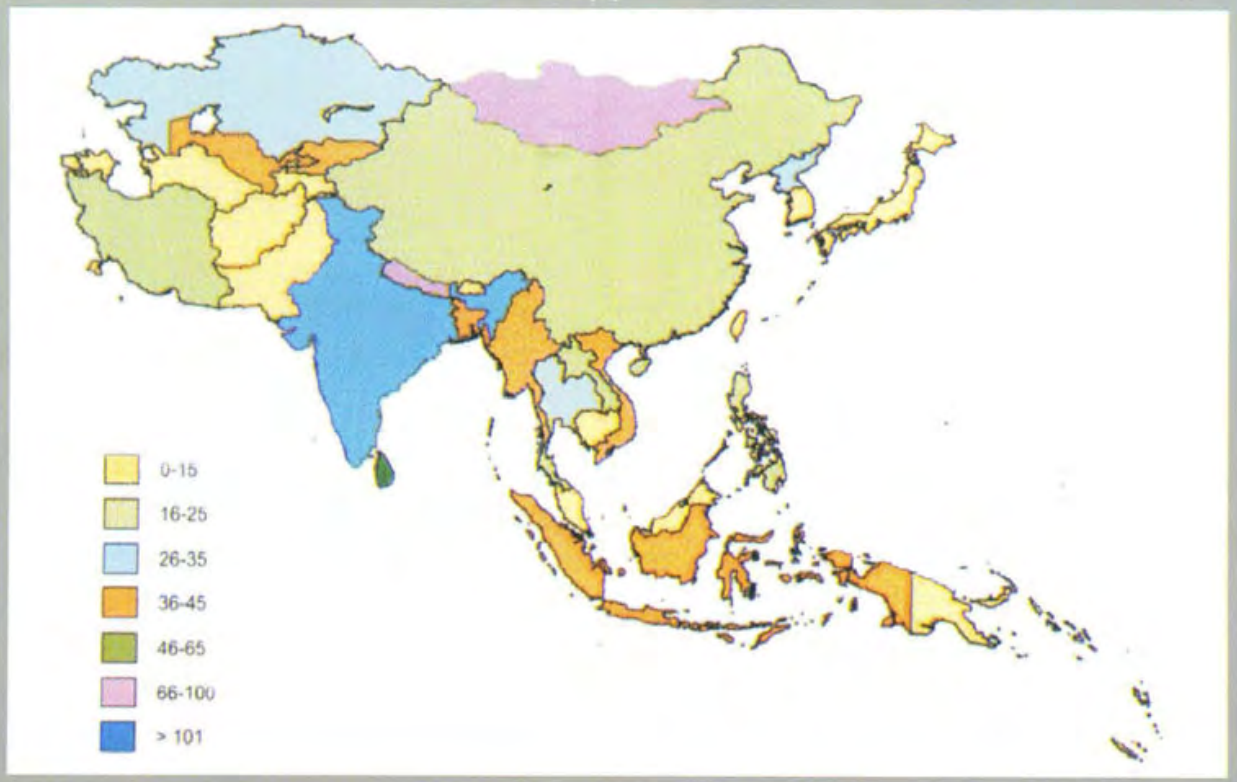
IMPORTANT

- The Application which is not complete in all respects is likely to be rejected
- Applicants should attach copies of certificates of:

a) Medical fitness (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)
b) Highest degree obtained (Degree certificate and marks sheet/grade card)
c) Proof of Proficiency in English
d) 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

Valedictory Function of Seventh Post Graduate Course in Space and Atmospheric Science (2010-11)

Countrywise Output from CSSTEAP programme



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