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

- Background
- Present status of Satcom course
- Plan for Short course in GNSS and LBS applications
GENESIS OF CSSTEAP

That the UN programme on Space applications focus its attention, inter-alia on the development of indigenous capability at the local level.

Resolution – “Establish Regional Centres for Space Science & Technology Education in existing National/Regional educational institutions in the developing countries”

The Centre for Asia and the pacific and the subsequent statement on the selection of India as Host country for the Centre

CENTRE ESTABLISHED AT DEHRADUN, INDIA
Regional Centres for Space Science and Technology Education
(affiliated to the United Nations)

- Central America: Mexico (CRECTEALC) 1997
- South America: Brazil (CRECTEALC)
- Asia: India (CSSTEAP) 1995
- Africa: Morocco (CRASTE-LF) 2008, Nigeria (ARCESSTE-E)
GOVERNING BOARD

- Governing Board is the principal policy making organ.
- At present, 15 countries in the region are represented in the Governing Board & two observers.
- The Executive functions are exercised by the Director of the centre.
- Meets once a year & Chaired by chairman, GB.

**DPR Korea, India, Indonesia, Kazakhstan, Kyrgyzstan, Malaysia, Mongolia, Myanmar, Nauru, Nepal, Philippines, Republic of Korea, Sri Lanka, Thailand, Uzbekistan, United Nations, The Netherlands**

ADVISORY COMMITTEE

- Technical arm of GB
- Composed of National & International subject experts
- Meets once a year and chaired by UN-OOSA
- Reviews all technical aspects
  - *curriculum*
  - *technical facilities*
  - *performance*
  - *students affairs*
- Reports to GB
EDUCATIONAL PROGRAMMES

9-month course at IIRS in RS/GIS
9-month course at SAC in SATCOM
9-month course at SAC in SATMET
9-month course at PRL in Space Science

Award of PG diploma by CSSTEAP

By Merit, since 2004 at IIRS

1 year follow-up project in home country

CSSTEAP 1 Yr Fellowship in India

Award of Masters (M.Tech) degree by Andhra University
The Centre has so far conducted **TWENTY SIX** PG courses

- **11** courses in RS & GIS
- **5** courses in SATCOM
- **5** courses in SATMET
- **5** courses in SPACE SCIENCE

The Centre conducted 18 short courses/Workshops in the last 10 yr.

These programmes have benefited 734 participants from 30 countries of AP region (444 from PG courses & 290 from short courses)

*This includes 26 participants from 16 countries from outside AP region in different courses*
<table>
<thead>
<tr>
<th>Year</th>
<th>RS &amp; GIS</th>
<th>SATCOM</th>
<th>SATMET</th>
<th>SPACE SC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996 - 97</td>
<td>25 Students</td>
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<tr>
<td></td>
<td>14 Countries</td>
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<td></td>
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<tr>
<td>1997 - 98</td>
<td>23 Students</td>
<td>13 Students</td>
<td>17 Students</td>
<td>10 Students</td>
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<td>1998 - 99</td>
<td>21 Students</td>
<td>18 Students</td>
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<td>1999 - 00</td>
<td>17 Students</td>
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<td>11 Countries</td>
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<td>2000 - 01</td>
<td>19 Students</td>
<td>21 Students</td>
<td>21 Students</td>
<td>09 Students</td>
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<td>13 Countries</td>
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<td>05 Countries</td>
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<td>2001 - 02</td>
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<td></td>
<td>13 Countries</td>
<td>08 Countries</td>
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<tr>
<td>2002 - 03</td>
<td>23 Students</td>
<td></td>
<td>19 Students</td>
<td>11 Students</td>
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<td>13 Countries</td>
<td>03 Countries</td>
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<tr>
<td>2003 - 04</td>
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<tr>
<td>2004 - 05</td>
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<td></td>
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<td>10 Countries</td>
<td>05 Countries</td>
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<tr>
<td>2005 - 06</td>
<td>19 Students</td>
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<td>12 Students</td>
<td></td>
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<td>13 Countries</td>
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<td>06 Countries</td>
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<td>2006 - 07</td>
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<td></td>
<td>14 Countries</td>
<td></td>
<td>11 Countries</td>
<td>07 Countries</td>
</tr>
</tbody>
</table>

Countries: Afghanistan, Azerbaijan, Bangladesh, Bhutan, Cambodia, China, DPR Korea, Fiji, India, Indonesia, Iran, Japan, Korea, Kazakhstan, Kyrgyzstan, Lao PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Papua N.G., Philippines, Sri Lanka, Thailand, Tajikistan, Taiwan, Uzbekistan, Vietnam
Present courses

At present two courses are being conducted

– Nine months PG course on Satellite communications at SAC, Ahmedabad, India
– Six weeks training course on Applications of Space Technology for Disaster Management support with emphasis on Flood risk management at Dehradun, India
1. Nine-month Post Graduate Diploma Courses
   Satcom - 1 (January - September 1997)
   Satcom - 2 (July 1999 – March 2000)
   Satcom - 3 (August 2001 – April 2002)
   Satcom - 4 (August 2003 – April 2004)
   Satcom - 5 (August 2005 – April 2006)

2. Workshops / short courses
   Distance education and training via satellite (1997)
   Application of Satellite Communication for development (2000)
   Digital Signal Processing (2001)
   Application of space science and technology for social scientists (2001)
No. of Participants in previous courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATCOM-1 (1997)</td>
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<tr>
<td>SATCOM-2 (1999-00)</td>
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<tr>
<td>SATCOM-3 (2001-02)</td>
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<tr>
<td>SATCOM-4 (2003-04)</td>
<td>15</td>
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<tr>
<td>SATCOM-5 (2005-06)</td>
<td>12</td>
</tr>
</tbody>
</table>

Total: 72

Diploma (deg)

- Bangladesh: 7
- India: 12 (6)
- Indonesia: 5
- Iran: 3 (2)
- Korea DPR: 6
- Korea Rep.: 1 (1)
- Kyrgyz Rep.: 3
- Mongolia: 11 (1)
- Nepal: 14 (2)
- Philippines: 1
- Sri Lanka: 4 (2)
- Uzbekistan: 4 (1)
- Vietnam: 1

from 13 countries
SATCOM-6

20 participants from 10 countries

Azerbaijan  1
Bangladesh  1
Bhutan      1 (Sponsored by UN-ESCAP)
India       2
Indonesia   1 (Sponsored By MOFGOI)
Kyrgyz Republic  3 (1 sponsored by UN-ESCAP)
Mongolia    5
Myanmar     1
Nepal       4 (1 Sponsored by UN-ESCAP)
Uzbekistan  1
SATCOM-6

3 Semester Course in 9 months

- Theory
- Practical
- Tutorial
- Educational Tours
- Seminars
- Pilot Project
- Examination
Satellite Navigation in Satcom PG Course

• Contents
  – Introduction to Satellite Navigation System
  – GPS and GLONASS
  – GPS user segment and applications
  – Wide Area Augmentation System
  – Time Synchronization Technique

• 15 hours of lecture
Plan for Short Course

• Satellite Navigation and its applications in location based services
• Duration : 6 weeks in Mid. 2008
• Need
  – No. of Navigation Satellites will exceed 100 in next five years
  – Worldwide investment in GNSS is very high
  – Location based service is expected to be useful to Govt., Enterprise, common people, security etc.
  – Trained manpower needed in manufacturing, sales, service and value addition
Proposed content

• Introduction to satellite based navigation
• Coordinate system and orbits
• Principles of ranging and range rate
• Principle of position fixing and time synchronisation, Introduction to CDMA techniques, Technique of Pseudorange and Carrier Phase measurements
• Principle of GPS, GLONASS and Galileo and Regional navigations satellites
Proposed content

• Position Accuracy (Sources of errors, Differential GPS – RTK positioning, Wide area Differential GPS, Applications in Land Survey and aircraft navigation)
• Receivers (Architecture, Types, manufacturers)
• Navigation services (basic services and value added services)
• Location Based Services (Integration of position and time with other information, Existing LBS services, Advantage of GNSS LBS over Cellular LBS, Designing a location based service, Revenue model)
Course format, venue & schedule

• Course Format
  – Classroom lecture
  – Practical
  – Laboratory visits
  – Evaluation

• Location & Time
  – SAC Ahmedabad, India
  – Six weeks in June-July 2008
Participants

– Maximum number 20
– Preferred from Asia and the Pacific countries
– Self Financing (International Funding Agencies will be requested to fund some candidates)
Faculty

From

- Academic Institutions
- Experts from Space Agencies
- Industry
WHO SHOULD ATTEND

The course is targeted to middle level managers of
Receiver Manufacturers
Location Based Service Providers
Academics for regional capacity building

WHAT THEY WILL LEARN

The participants will be exposed to, relevant technologies, so as to get an in depth understanding of how these can be used in an operational scenario.
Request to ICG-2 WG-C members

- Comment on course content
- Suggest Faculty
- Suggest Funding Agency for participants travel etc.
- Suggest names of participating agencies / institutions