Education and Training Activities in Space technology and applications

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ICG
International Committee on Global Navigation Satellite Systems

Sep 7, 2011 Tokyo, Japan
• Education and Training Activities
• Understanding ICG information center
• Views of ICG information center
• Future work
1 Education and Training Activities

In the year of 1968, United Nations (UN) held the first conference on the exploration and peaceful uses of outer space. In the year of 1971, United Nations Outer Space Council presented the Programme on Space Applications.

In the 1982 and 1999 respectively, at the second and third conference on the exploration and peaceful uses of outer space, UN expanded the task areas on space applications.

*China has shown active avocations in response to the Program launched by UN and proposed to set up an Asia-Pacific Space Cooperation Organization (APSCO), developed education and training program in space technology applications from 2001.*
A quick GLANCE at BUAA

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NATIONAL KEY DISCIPLINES (1st level) 8
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ACADEMICIANS OF CAS AND CAE 15
UNDERGRADUATE PROGRAMS 49
MASTER’S PROGRAMS 144
DOCTORAL PROGRAMS 49

Established in 1952, was the first aerospace engineering university in China.
In October, 2004, Master degree program in Space Technology and Applications (MASTA) was authorized by the Minister of Education, China, which is the first and only one specialty program arranged its education curriculum according to the UNOOSA up to now in China.

**MASTA Program Outlook**

<table>
<thead>
<tr>
<th>Year</th>
<th>Directions</th>
<th>Number</th>
<th>Country</th>
<th>Sponsors</th>
<th>Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>RS and GIS</td>
<td>14+4</td>
<td>7+1</td>
<td>Space Agency, APSMCS</td>
<td>Space Agency</td>
</tr>
<tr>
<td>2008</td>
<td>RS and GIS</td>
<td>11</td>
<td>4</td>
<td>CSC</td>
<td></td>
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<tr>
<td>2010</td>
<td>RS and GIS</td>
<td>11+1</td>
<td>5+1</td>
<td>CSC Special Program</td>
<td>ICG information center</td>
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<tr>
<td>2011</td>
<td>SACOM</td>
<td>16</td>
<td>9</td>
<td>CSC Special Program</td>
<td>ICG information center</td>
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<tr>
<td>2012</td>
<td>GNSS</td>
<td></td>
<td></td>
<td>CSC Special Program</td>
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</tr>
</tbody>
</table>
Education and Training

MASTA 2006 Closing Ceremony

MASTA 2008 Thesis Defense
Space Technology and Applications Education

Short training Courses held at Beihang
Cooperated with APSCO

<table>
<thead>
<tr>
<th>Year</th>
<th>Topic</th>
<th>Number</th>
<th>Country</th>
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</thead>
<tbody>
<tr>
<td>2000</td>
<td>Satellites Technology</td>
<td>22</td>
<td>10</td>
</tr>
<tr>
<td>2002</td>
<td>Remote sensing Applications</td>
<td>31</td>
<td>18</td>
</tr>
<tr>
<td>2003</td>
<td>Space Technology and Remote sensing</td>
<td>29</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Applications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>Remote sensing Data Processing and</td>
<td>42</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Applications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Space Technology and Applications Education

Several Big Events

a) In Sep. 2006, Mr. Sergio Camacho, Director of Office for Outer Space Affairs visited Beihang University.

b) Ms. Alice Lee, Vice Director of Office for Outer Space Affairs attend the opening ceremony the MASTA2006
c) **International Space University** - Summer session

During 24, June and 24, August in 2007, Beihang University and China Aerospace Science and Technology Corporation held the summer session program for in Beijing. 117 students from 25 countries, and more than 150 experts and 49 foreign staff attend the program.
Space Technology and Applications Education

4) United Nations/China/European Space Agency Training Course  2006

UNITED NATIONS/CHINA/ EUROPEAN SPACE AGENCY TRAINING COURSE
ON THE USE AND APPLICATIONS OF
GLOBAL NAVIGATION SATELLITE SYSTEMS

4 – 8 December 2006

Room 0323, ZhongGuanCun FOUNDER TOWER, No. 298,
Chengfu Road, Haidian District

Beijing, China

- National Remote Sensing Centre of China and
GNSS Technology Training Cooperation Centre
Capacity Building for Space Technology and Applications Education

Data From FY2, FY3, MODIS, EOS, SPOT4, etc can be accepted in real time.

Beihang Remote Sensing Data Receiving Ground station
(Established in August, 2010, located nearby the New Main Building)
Capacity Building for Space Technology and Applications Education

20 Computers, Equipped with the latest ArcGIS 10 Software Package, ENVI/IDL

6 Screens can be connected with related Computers in the lab or Remote Computers or Video Cameras through Internet

Space Technology and Applications Research and Teaching (START) Lab

(Established in April, 2011, located in the 5th FL International School)
Capacity Building for Space Technology and Applications Education

GNSS/GPS/GPRS/GIS Teaching Experiment Lab

(Established in 2009, located in New Main Building)
Capacity Building for Space Technology and Applications Education

RS
GIS
GNSS

“3S”
Integrated, network sharing

Distant Education/Learning Model Classroom
International Cooperation - UPS strategy
At Beihang University

U University to University
P Professors to Professors
S Students to Students
2 Understanding ICG information Centre

In 2008 of the Third Meeting of ICG 3, the ICG plenary agreed that the UN-affiliated Regional Centres for Space Science and Technology Education would be act as Information Centres for ICG.
2 Understanding ICG information Centre

Action C1: Establish the ICG information portal drawing on contributions from Members, Associate Members and Observers of the Committee. This will include a calendar of GNSS-related events.

Action C2: Identify undergraduate and graduate courses on GNSS to be included on the ICG information portal.

Action C3: Consider the possibility of disseminating a list of relevant textbooks on GNSS in English and other languages through the ICG information portal. Consideration will also be given to developing a glossary of terms and definitions.

Action C4: Consider the use of the Regional Centres for Space Science and Technology Education, affiliated to the United Nations, to promote GNSS use and applications.

Action C5: Identify international conferences where Members, Associate Members and Observers will make presentations on the existence and work of the ICG. A list of such events will be maintained on the ICG information portal.

New Action is suggested to add more education and training activities on GNSS in accompany with the development of technology and users demand.
3 Views of ICG Information Center

- Construction Mode
- Teaching Affairs
- Teaching and Practice base
- Students Manage and Service System
Construction mode (UGI U Mode) 建设模式
• UNOOSA Supervised
• Government / Agency Supported 政府支持
• Industry/ Intuitions Participated 企业参与
• University located 学校依托

Implement:

Mutual benefits, 互利
All-win, 共赢
Sustainable Development 可持续
Education Affairs

• Pursue to quality education with world class professors/instructors and characteristic curriculum/course

• Take full use of ICT technologies to establish a distance learning environment and facilitate teaching resources sharing and reduce costs and benefit more people.
Education Affairs

Education and Training Programs
(1) Master degree program on GNSS
(2) Senior training program for management
(3) Senior training program for professional
(4) Fundamental program on GNSS
(5) Practical program on GNSS
(6) Distance learning classes on GNSS
(7) Seminars on GNSS
(8) Summer school on GNSS

With various level for beginner and advance
Education Affairs

To Establish a Teaching and Practice Experience Lab of GNSS at Beihang University sponsored by industry

Let students learn and understand through Practice and Practice with fun!
Students manage and service system

Establish students information manage system.

Collect user’s feedback to all GNSS systems in each education program.
A student is a user of GNSS as well a tester.

Students centered,
Quality education,
Brand Promotion!
Space Science and Technology Education Centre at Beihang University

1. Different level Education and training
2. Terms and regulations
3. International Communication and Cooperation
4. Enterprise Communication and Cooperation
5. Website /support distant learning
6. Use case database
7. Curriculum/Courseware design and development centre
8. User information management

Education Training Centre
# 4 Future work

*Master Degree Program on GNSS will be held in September 2012 at Beihang university.*

<table>
<thead>
<tr>
<th>COURSE</th>
<th>HOURS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fundamental Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Space segment and track spacecraft system overview</td>
<td>48</td>
<td>3</td>
</tr>
<tr>
<td>GNSS Timing spatial Reference System and maintenance</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>GNSS principle</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td><strong>Science and Technical Course</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>navigation signal Simulation and test Technologies</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>GNSS receiver principles and design</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>GNSS/INS intergration navigation principle and technologies</td>
<td>32</td>
<td>2</td>
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<tr>
<td>GNSS principle experiment</td>
<td>18</td>
<td>1</td>
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<tr>
<td><strong>Application Courses</strong></td>
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<tr>
<td>GNSS new technologies and applications</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>GNSS vehicle navigation applications technologies</td>
<td>16</td>
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</tr>
<tr>
<td>GNSS aviation navigation applications technologies</td>
<td>16</td>
<td>1</td>
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<tr>
<td>high precision positioning and its applications</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>GNSS applications in timing</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>
4 Further work

With the development of Beidou satellite system, we will continue to work on Education and Training activities of GNSS.

Enjoy GNSS

Better tomorrow
Vision Hotel (4 Stars)

Located in Zhongguancun Science and Technology Park

Close to the Olympic Park, Two 4 stars Hotel in Walking distance

Facilities: Indoor swimming pool, Tennis court, Museum, Concert Hall, etc
Thanks
For Your Attention!