MASTA 2020

Master Program on Space Technology Applications

Overview

Space technology and its applications, the most fascinating technical achievement of the human race in the last six decades, has undoubtedly advanced with great stride. The various practical benefits of space technology play a central role in international development efforts.

Master of Space Technology Applications (MASTA) is regular program of APSCO since 2006. This Program is an elaborately designed and intensive Master Program for students who are interested in space technology and its application. It focuses on both knowledge acquisition and operational training, and is an application-oriented program. It provides a powerful platform for scholars and professionals to obtain more opportunities for communicating and experiencing the space technology practice. This program is jointly sponsored and organized by APSCO, China Scholarship Council (CSC) and Beihang University. All Member States actively participated in these programs. The MASTA program has enrolled totally 298 postgraduate students from 21 countries, among which 194 students have graduated and obtained the Master's Degree on Space Technology Applications.

MASTA is designed to give participants a competitive edge by:

- ✧ Broadening their knowledge on space-related issues and activities and encouraging participants to use acquired knowledge and skills through practical, hands-on experience;
- ✧ Providing a variety practice opportunities (include watching satellite launching on site, attending international conferences/workshops, etc.);
- ✧ Internationally qualified professors and experts from a diversity of academic backgrounds;

- ✧ Modularized curricula design and flexible study modes;
- ✧ Developing the cross-cultural communication skills with an internationalized atmosphere.

The main educational fields of MASTA Program include Remote Sensing and Geographic Information Systems (RS&GIS), Satellite Communications, Global Navigation Satellite System (GNSS), Micro-satellite Technology, Space Law and Policy, Space Science and Environment, etc.

This program is carried out according to the regulations and requirements of Beihang University. Referring to the Education Curricula of UN-PSA, the study period is divided into two phases:

(a) 9-month Course Study

(b) 12 months Thesis Research

<table>
<tr><td colspan="4">Phase Ⅰ
Course Study in China: 9 months (at Beihang University)
(Leading to Course completion Certificate)</td></tr>
<tr><td></td><td>Module Ⅰ</td><td>Module Ⅱ</td><td>Module Ⅲ</td></tr>
<tr><td>Formulation of an Individual Training Plan</td><td>Common Platform Courses</td><td>● Major courses
● Academic Lectures
● Professional Visits</td><td>● Pilot Project or Practical Courses</td></tr>
<tr><td colspan="4">Phase Ⅱ
Thesis Research: 12 months (in China or home country)
(Leading to Master’s Degree in Engineering)</td></tr>
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Lectures are conducted in English. The thesis for project practice is required to be written in English. Courses are organized into three modules as given above.

Participants will be awarded with the Graduation Certificate of Beihang University and Master’s Degree Certificate of the People’s Republic of China when fulfilling the required credits and passing the thesis defense.

The faculty for this program consist of professors, experts and senior engineers from Beihang University and some other institutes or academies of China and abroad. The core faculty members have long and varied experience in the field of space science and technology. In addition, they have accumulated considerable teaching experience over the years and are skilled in teaching and advising international students.

International Education at Beihang University

International education at Beihang University (also known as BUAA) was inaugurated in the early 1990s and has continued to develop at a very fast pace. By the end of 2019, over 2,300 international students from more than 120 countries are studying at Beihang, among which over 1,300 are pursuing their doctoral, master, or bachelor degrees. By 2019, more than 2,300 international students have successfully graduated with degrees from Beihang. Batches of outstanding international alumni are playing a great role at work and contributing to the prosperity and development of the world.

International student programs at Beihang mainly include bachelor degree programs, master degree programs, doctoral degree programs, as well as various non-degree programs such as Chinese language training programs and visiting scholar programs. Beihang University is one of the few universities in China where English is used as its primary language of instruction for all international master and doctoral programs, as well as some of its bachelor programs.

Beihang endeavors to build a world-renowned international education platform. In 2014, the Regional Centre for Space Science and Technology Education in Asia and the Pacific (China) (affiliated to the United Nations) was established at Beihang University with the support of the Chinese Government.

Beihang has established the Confucius Institute in cooperation with Kogakuin University (Japan) and set up HSK and HSKK authorized testing centers, providing various international education programs for students of different levels in Chinese language training, Chinese cultural studies and so on.

Beihang is devoted to the innovation of international talent training mode, which can be exemplified by the integrated education of Chinese students and international students, and credit transfer programs for one year or half a year in cooperation with famous universities in France, Sweden, Ireland and many other countries all over the world.

Beihang is qualified to admit all categories of international students, including those sponsored by the Chinese Government Scholarship. The Beihang Scholarship for international students was established in 2007 to encourage and support the coming of excellent international students to Beihang, and since then hundreds of exceptional international students have been awarded the

scholarship. Scholarships for international students mainly include Chinese Government Scholarship (CGS), Beijing Government Scholarship, Beihang International Student Scholarship, Confucius Institute Scholarship, scholarships from enterprises, etc.

In a new era of international education, Beihang continues to strive to provide higher quality education and excellent service for international students, and sincerely welcomes students from all over the world to study here.

Study at Beihang, light the dream.

For more details, please visit our website： http://is.buaa.edu.cn

Application Qualifications

- The applicant should be under the age of 35;
- The applicant should have some professional experiences of working in space technology industry or research institutes;
- The applicant should have Bachelor Degree of relevant discipline or the diploma equivalent to Bachelor Degree;
- The applicant is expected to have good command of English and the ability to take courses in English;
- The applicant is supposed to have research background in relevant areas.

Note: Please notice as a special requirement that selected applicants should come to study at Beihang University with their Private Passports only (not official/service/other types of passport).

Applicants of this program are mostly recommended by organizations. Students who are interested to do self-sponsor, please visit website (http://admission.buaa.edu.cn/) for further information.

Fees

- Tuition Fee: 35000 Yuan (RMB) per year;
- Insurance: 800 Yuan (RMB) per year;
- Accommodation: Double-bed room, 750 Yuan (RMB)/month, per bed (not including costs like water, electricity, etc.).

Scholarship and Financial Support

1. The applicants are welcomed to apply for the Chinese Government Scholarship (CSC Scholarship) at Beihang University.

The Full CSC scholarship will cover the following items:

- ✧ Tuition fee for 2 years;
- ✧ Free accommodation during study at the University (not including costs like water and electricity, etc.);
- ✧ Living allowance during stay at the University (3000 RMB per month or according to the standard of CSC);
- ✧ Medical Insurance only for accidents and hospitalization treatments, according to the standard of CSC.

2. The applicants who fail to get the CSC Scholarship will have chance to get Beijing Municipal/Beihang Scholarship. **Beijing Municipal/Beihang Scholarship will only cover tuition fee.**

Application Procedures and Required Documents

Step 1: Apply online

Make the online application for Chinese Government Scholarship on the website of CSC ***http://studyinchina.csc.edu.cn)***: fill up the Application Form, submit the completed Application Form and supporting documents online, and print the Application Form according to the requirements. Please note that the specialty should be chosen as "Space Technology Applications" and the language of instructions should be chosen as "English". Please also note that the "**Program Category**" should be "**Type B**" and the "**Agency Number**" of Beihang University is **10006**.

Step 2: Prepare documents

1. Application Form for Chinese Government Scholarship;
2. Highest Education Diploma (notarized photocopy or original one) or Certificate of Expected Graduation Date from the university studying currently;
3. Notarized Transcripts or Original Ones;
4. Study or Research Plan (no less than 500 words);
5. Two Recommendation Letters from Professors or Academic Experts;
6. The Results of TOEFL, IELTS or English Proficiency Certificates;
7. Photocopy of Physical Examination Form and the Report on Blood Examination;

   Attachment 1-FOREIGNER PHYSICAL EXAMINATION FORM.pdf
8. Photocopy of First Page of Passport (the information page);
9. The List of Application Documents and Post Address confirmed.

   Attachment 2-List of Application Documents.doc

Note: *All the documents should be in duplicate. And the language of documents should be in English or Chinese or attached with translations in English or Chinese.*

Step 3: Submit documents

Mail all required documents to the following address before March 8, 2020.

Ms. Jessica Zhuang

Address: ASIA-PACIFIC SPACE COOPERATION ORGNIZATION (APSCO),
Building 13&14, Section 3, No.188, South Street Fourth Ring, Fengtai District, Beijing, China, Post Code: 100070

Tel: +86-(0)10-6370 2677 Ex. 405 Fax: +86-(0)10-6370 2286

Note: *In order to speed up your application process, scanned copies can be emailed to the Contact Person: Jessica@apsco.int so that we can get your information in advance. And **mail all the required documents to the Contact Person at APSCO** by the already set deadline **(March 8, 2020)**. APSCO and Beihang University will acknowledge the receipt of your application after evaluation. No application documents will be returned after submission.*

Important Dates

- Applicants should mail the required applications documents **to the Contact Person at APSCO** by **March 8, 2020**.
- The results of admission will be notified by stages **from May 20 to early August, 2020**.
- The Admission Notice and related documents will be mailed to the successful applicants before **August 8, 2020**.
- The program will start in **early September 2020**.

Contact Information

- Ms. Jessica Zhuang
- **Address**: ASIA-PACIFIC SPACE COOPERATION ORGNIZATION (APSCO)
- Building 13&14, Section 3, No.188, South Street Fourth Ring, Fengtai District, Beijing, China, Post Code: 100070
- **Telephone**: +86-(0)10-6370 2677 Ex. 405
- **E-mail**: Jessica@apsco.int
- **Website of APSCO**: http://www.apsco.int
- **Website of International School, Beihang University**: http//is.buaa.edu.cn
- **Website of Beihang University**: http://ev.buaa.edu.cn/
- **Website of China Scholarship Council**: http://studyinchina.csc.edu.cn

In 2020, MASTA Program provides four educational fields: Satellite Communications and Global Navigation Satellite Systems (SC&GNSS), Remote Sensing and Geo-information System (RS&GIS), Space Law and Policy, Space Science and Environment. The followings are detailed information of each field.

Satellite Communications and Global Navigation Satellite Systems (SC&GNSS)

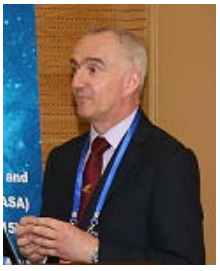
Satellite Communications are space microwave communications between radio stations on Earth (including land, water and the lower atmosphere), using Artificial Earth satellite as relay stations to transmit radio waves. Global Navigation Satellite System (GNSS) provides positioning, navigation and timing services for the whole world. Communications and navigation satellites are the most important national spatial information infrastructure in the social life and military affairs in modern times. They would serve people in many areas together with Remote Sensing, Geographical Information System such as global personal communications, disaster management, emergency response, land, aviation and maritime transportation, etc.

The objective of the program is to enable the students to master the principles, technologies and systems of satellite communications, as well as the special problems and technologies of Internet services and broadband integrated services in satellite communication systems. In addition, the GNSS principles, receiver design, data processing and application cases are introduced. The program also provides opportunities for students to touch the frontier technologies on Satellite Communications and GNSS.

Professionals/Experts (partial)

Yang Yuanxi

Academician, Chinese Academy of Sciences



Renato Filjar

Professor, University of Jica, Croatia

Shen Jun

Chief Scientist, Beijing UniStrong Science & Technology Co., Ltd.

Yang Dongkai

Professor, School of Electronics and Information Engineering, Beihang University

Shi Chuang

Chief Scientist, Beidou Research Institute

Partners

The partners of this program include:

National Remote Sensing Center of China

9-month Course List

No.	Item	Class Hrs	Credits	Remark
Module Ⅰ Platform Courses				
PC1-1	Probability and Statistics in Engineering	48	3	Select one of them. Compulsory
PC1-2	Theory of Matrix	48	3	
PC1-3	Numerical Analysis	48	3	
PC2-1	Matlab Programming	32	2	Compulsory
PC3-1	Space Environment, Orbit and Spacecraft Systems	48	3	Compulsory
PC3-2	Introduction to Space Technology Applications	16	1	Compulsory
PC3-3	International Cooperation in the Peaceful Uses of Outer Space	16	1	Compulsory/ Optional
PC4-1	Chinese (level 1)	60	2	Compulsory
PC4-2	Chinese (level 2)	60	1	Compulsory
PC4-3	Introduction to China	16	1	Compulsory
PC5-1	Scientific Literature Retrieval	16	1	Compulsory
PC5-2	Scientific Thesis Writing /Academic Writing & Presentation	16	1	Compulsory
Module Ⅱ Major Basic Courses & Major Courses				
MC2-1	Principles of communications	32	2	Compulsory
MC2-2	Principle of Global Navigation Satellite Systems	32	2	Select at
MC2-3	Wireless communications	32	2	

No.	Item	Class Hrs	Credits	Remark
MC2-4	Satellite Laser Communications	16	1	least 7 compulsory credits
MC2-5	Satellite Telemetry and Telecommnd Technology	16	1	
MC2-6	GNSS Receiver Principles and Design	32	2	
MC2-7	GNSS/INS Integration Navigation	16	1	
MC2-8	Satellite Navigation Data Processing	32	2	
MC2-9	Satellite Communications and Satellite Networks	32	2	
MC2-10	Fundamentals of microwave in satellite application	16	1	
MC2-10	SatCommu./GNSS Experiments	16	1	Compulsory
MC2-11	SatCommu./GNSS Applications	16	1	Compulsory
MC2-12	Satcommu/GNSS New Technologies	16	1	Compulsory
Module Ⅲ Team Pilot Projects				
PPC	Team Pilot Project	2 months	6	Compulsory

Remote Sensing and Geo-information System (RS&GIS)

Remote sensing is the art and science of making measurements of the earth using sensors on airplanes or satellites. These sensors collect data in the form of images and provide specialized capabilities for manipulating, analyzing, and visualizing those images. A geographic information system (GIS) is a computer-based tool for mapping and analyzing feature events on earth. Remote sensed imagery is integrated within a GIS. The potential of remote sensing (RS) techniques, coupled with geographical information systems (GIS), are widely recognized as supporting tools for the planning, monitoring, and management of the appropriate utilization of resources at the country, regional and global levels.

MASTA Students specializing in Remote sensing & Geo-Information System will get training in both the underlying theory and the application of remote sensing, spatial analytical methods, digital cartography, and geographic information systems. Students will be provided with many professional visits to learn how remote sensing and GIS technologies are currently applied in various fields such as natural resource management, environmental monitoring, disaster assessments, and other related fields. Some leading national and international geoinformatics practitioners will be invited to lead training or seminars to highlight industrial, commercial and governmental applications.

Professionals/Experts (partial)

He Linshu

Professor, Beihang University

Liu Qinhuo

Professor, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences

Liu Yalan

Professor, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences

Tan Yumin

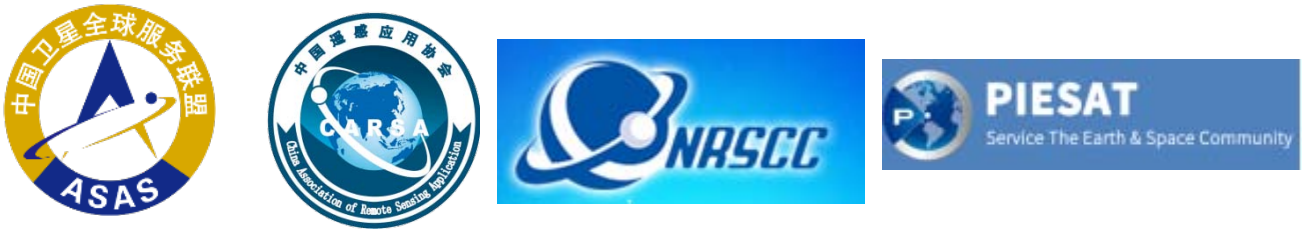
Associate Professor, Beihang University

Xu Liping

General Manger, Beijing Space View Technology Co.,Ltd.

Partners

The partners of this program include:



International Alliance of Satellite Application Service

National Remote Sensing Center of China

9-month Course List

No.	Item	Class Hrs	Credits	Remark
Module Ⅰ Platform Courses				
PC1-1	Probability and Statistics in Engineering	48	3	Select one of them. Compulsory
PC1-2	Theory of Matrix	48	3	
PC1-3	Numerical Analysis	48	3	
PC2-1	Matlab Programming	32	2	Compulsory
PC3-1	Space Environment, Orbit and Spacecraft Systems	48	3	Compulsory
PC3-2	Introduction to Space Technology Applications	16	1	Compulsory
PC3-3	International Cooperation in the Peaceful Uses of Outer Space	16	1	Compulsory/ Optional
PC4-1	Chinese (level 1)	60	2	Compulsory
PC4-2	Chinese (level 2)	60	1	Compulsory

No.	Item	Class Hrs	Credits	Remark
PC4-3	Introduction to China	16	1	Compulsory
PC5-1	Scientific Literature Retrieval	16	1	Compulsory
PC5-2	Scientific Thesis Writing /Academic Writing & Presentation	16	1	Compulsory
Module Ⅱ Major Basic Courses & Major Courses				
MC1-1	Remote Sensing Image Visual Interpretation	16	1	Compulsory
MC1-2	Remote Sensing Principles and Methods	32	2	Compulsory
MC1-3	Physical Principles of Microwave Remote Sensing	32	2	Compulsory
MC1-4	Remote Sensing Image Processing and Software Application	48	3	Compulsory
MC1-5	Geographic Information System: Design and Practice	16	1	Compulsory
MC1-6	Natural Disaster Remote Sensing	16	1	Compulsory
MC1-7	Case Studies in the Applications of RS & GIS	16	1	Compulsory
Module Ⅲ Team Pilot Projects				
PPC	Team Pilot Project	2 months	6	Compulsory

Space Law & Policy

Space law and policy can be described as the rules governing space-related activities.,whether such activities are carried on by governmental agencies or by non-governmental entities. Capacity-building, training and education in space law and policy could help to promote international development and cooperation in space activities and provides the means for a deeper understanding of the interdependent roles of science, technology and law in this area. In view of this, space law and policy play an important role in space technology applications.

Currently, Space law education has received more and more attention from all countries. At the Regional Centre level, an International Training Program on Space Law and Policy was successfully held by RCSSTEAP from 17-25 September, 2015. With the success of the short training program, the Centre opened a new major ”Space Law and Policy” in MASTA Program since 2016, with an enrollment of ten participants from seven countries. Thus the RCSSTEAP is the first Regional Centre to set up the master programme on space law and policy among six Regional Centres. In 2018, twelve participants from nine countries were enrolled.

The master program on Space Law and Policy will focus on training professional talents who are familiar with space law and policy for countries in the Asia-Pacific region and other developing countries. The participants will master and fully utilize the knowledge of space law and policy, while having the necessary knowledge of space science, technology and application, so as to engage in the works with regard to research on space law and policy, legal consulting and management of space activities, national space legislation, space policy-making and international space cooperation.

Referring to the regulations in the Space Science and Technology Education Center-Curriculum (A/AC. 105.649) issued by UN in 1996, the whole study period for this master program can be divided into two stages: course study(9 months) and Thesis Writing(12 months ,either in China or in students’ home countries). After completing the required credits and successfully defending the dissertation, the participants will be awarded the Master Degree of Law (Direction of Space Law and Policy).

Today, the program has cultivated many outstanding talents for countries around the world. As the representatives of outstanding graduates, Aisha Jagirani from Pakistan and Taw-wong Youyod from Thailand participated in the Fifty-eighth session of Legal Subcommittee of UNCOPUOS as the members of their government delegations. Currently, Aisha Jagirani works in the Department of External Relations and Legal Affairs of the APSCO. For the 2018 class, Anna Paula Castro De Paula Nunes from Brazil was approved upon voluntary application to take a 3-month internship in the United Nations office for Outer Space Affairs from July to October, 2019.

Professionals/Experts (partial)

Sergio Camacho

Former Director of UNOOSA

Joanne Gabrynowicz

Professor Emerita, University of Mississippi, USA

Zhao Yun

Professor, Hongkong University

Li Bin

Associate Professor, University of Newcastle, Australia

Xia Chunli

Associate Professor, Beihang University

Partners

9-month Course List

No.	Item		Class Hrs	Credits	Remark
Module Ⅰ Platform Courses					
PC3-1	Space Environment, Orbit and Spacecraft Systems		48	3	Compulsory
PC3-2	Introduction to Space Technology Applications		16	1	Compulsory
PC3-3	International Cooperation in the Peaceful Uses of Outer Space		16	1	Compulsory
PC4-1	Chinese (level 1)		60	2	Compulsory
PC4-2	Chinese (level 2)		60	1	Compulsory
PC4-3	Introduction to China		16	1	Compulsory
PC5-1	Scientific Literature Retrieval		16	1	Optional
PC6-1	International law		32	2	Compulsory
Module Ⅱ Major Basic Courses & Major Courses					
MC4-1	International space law		32	2	Compulsory
MC4-2	Organization and supervision of space activities		16	1	Compulsory
MC4-3	National Space Legislation and policy		32	2	Compulsory
MC4-4	Remote Sensing Law		16	1	Compulsory
MC4-5	Satellite Communication Law		16	1	Compulsory
MC4-6	Space environment protection and LTS		16	1	Compulsory
MC4-7	Space commercialization and the development of Space Law		16	1	Compulsory
AL4-1	Hot Topics on Space Law I		16	1	Compulsory
AL4-2	Hot Topics on Space Law II		16	1	Compulsory
Module Ⅲ Team Pilot Projects					
LPC	Legal practice	Legal Visits	8 weeks	6	Compulsory
		Country Report			
		Team Research			
		Space Law Moot Court Competition			

Space Science and Environment

Space science allows us to look outwards from our Earth to the Sun and beyond. The launch of satellites in 50's enabled the exploration of the outer space, and fostered the development of space science. It's a newly rising inter-discipline that strives to answer the ultimate questions: How did the Earth and other planets in the solar system evolve? How do they interact with the Sun? How did the Stars form and evolve? Do we have counterparts in the Universe? Do we have habitable planets in the Universe?

The program aims to enable the students to master the knowledges, principles, and technologies of space science, as well as the methods of analyzing satellite data and numerically modeling the space environment. In addition, the historical and cutting-edge scientific research topics are introduced. The program also provides opportunities for students to participate in research projects associated with newly launched spacecraft missions and state-of-the-art numerical models in the world.

Professionals/Experts (partial)

			
Malcolm Dunlop Professor, School of Space & Environment, Beihang University	**Keizo Fujimoto** Professor, School of Space & Environment, Beihang University	**Zhonghua Yao** Associate Professor, Institute of Geology & Geophysics, Chinese Academic of Science	**Bingjun Zhu** Associate Professor, School of Space & Environment, Beihang University

Partners

The partners of this program include:

中国地球物理学会 Chinese Geophysical Society

中国空间科学学会 Chinese Society of Space Research

9-month Course List

No.	Item	Class Hrs	Credits	Remark
Module Ⅰ Platform Courses				
PC1-1	Probability and Statistics in Engineering	48	3	Select one of them. Compulsory
PC1-2	Theory of Matrix	48	3	
PC1-3	Numerical Analysis	48	3	
PC2-1	Matlab Programming	32	2	Compulsory
PC3-1	Space Environment, Orbit and Spacecraft Systems	48	3	Compulsory
PC3-2	Introduction to Space Technology Applications	16	1	Compulsory
PC3-3	International Cooperation in the Peaceful Uses of Outer Space	16	1	Compulsory/ Optional
PC4-1	Chinese (level 1)	60	2	Compulsory
PC4-2	Chinese (level 2)	60	1	Compulsory
PC4-3	Introduction to China	16	1	Compulsory
PC5-1	Scientific Literature Retrieval	16	1	Compulsory/ Optional
PC5-2	Scientific Thesis Writing /Academic Writing & Presentation	16	1	Compulsory
Module Ⅱ Major Basic Courses & Major Courses				
MC5-1	Introduction to Space Science	32	2	Compulsory
MC5-2	Computational Space Physics	32	2	Compulsory
MC5-3	Remote Sensing of Planetary Space	16	1	Compulsory
MC1-2	Remote Sensing Principles and Methods	48	3	Select at least 5 Compulsory credits
MC4-2	Structural Analysis and Optimization	48	3	
MC4-1	Orbital Mechanics	48	3	
MC5-4	Fundamental of Aerospace Science	32	2	Compulsory
Module Ⅲ Team Pilot Projects				
PPC	Team Pilot Project	2 months	6	Compulsory