



北京理工大学  
BEIJING INSTITUTE OF TECHNOLOGY

2022

# International Graduate Program



Graduate School  
2022.7



# **2022**

# **International Graduate Program**

**Graduate School**  
**2022.7**

学科代码 Program Code	学科名称 Program	牵头学院 School
020100	理论经济学 Theoretical Economics	人文学院 School of Humanities and Social Sciences
020200	应用经济学 Applied Economics	管理与经济学院 School of Management and Economics
030100	法学 Law	法学院 School of Law
040100	教育学 Education	人文学院 School of Humanities and Social Sciences
045300	汉语国际教育 Master of Teaching Chinese to Speakers of Other Languages	外国语学院 School of Foreign Languages
070100	数学 Mathematics	数学与统计学院 School of Mathematics and Statistics
070200	物理学 Physics	物理学院 School of Physics
070300	化学 Chemistry	化学与化工学院 School of Chemistry and Chemical Engineering
071000	生物学 Biology	生命学院 School of Life Science
083100	biomedical 工程 Biomedical Engineering	生命学院 School of Life Science
071400	统计学 Statistics	数学与统计学院 School of Mathematics and Statistics
080100	力学 Mechanics	宇航学院 School of Aerospace Engineering
080200	机械工程 Mechanical Engineering	机械与车辆学院 School of Mechanical Engineering

Beijing Institute of Technology Graduate Program 2022

学科代码 Program Code	学科名称 Program	牵头学院 School
080300	光学工程 Optical Engineering	光电学院 School of Optoelectronics
080400	仪器科学与技术 Instrument Science and Technology	光电学院 School of Optoelectronics
80500	材料科学与工程 Materials Science and Engineering	材料学院 School of Materials Science and Engineering
080700	动力工程及工程热物理 Power Engineering and Engineering Thermophysics	机械与车辆学院 School of Mechanical Engineering
080900	电子科学与技术 Electronics Science and Technology	集成电路与电子学院 School of Integrated Circuits and Electronics
081000	信息与通信工程 Information and Communication Engineering	信息与电子学院 School of Information and Electronics
081100	控制科学与工程 Control Science and Engineering	自动化学院 School of Automation
081200	计算机科学与技术 Computer Science and Technology	计算机学院 School of Computer Science and Technology
081700	化学工程与技术 Chemical Engineering and Technology	化学与化工学院 School of Chemistry and Chemical Engineering
082500	航空宇航科学与技术 Aeronautics & Astronautics Science & Technology	宇航学院 School of Aerospace Engineering
082600	兵器科学与技术 Armament Science and Technology	机电学院 School of Mechatronical Engineering
083100	生物医学工程 Biomedical Engineering	生命学院 School of Life Science
083700	安全科学与工程 Safety Science & Engineering	机电学院 School of Mechatronical Engineering
083900	网络空间安全 Cyberspace Science	网络空间安全学院 School of Cyberspace Science and Technology
120100	管理科学与工程	管理与经济学院

## Beijing Institute of Technology Graduate Program 2022

学科代码 Program Code	学科名称 Program	牵头学院 School
	Management Science and Engineering	School of Management and Economics
120200	工商管理 Business Administration	管理与经济学院 School of Management and Economics
125100	工商管理硕士 Master of Business Administration	管理与经济学院 School of Management and Economics
130500	设计学 Design	设计与艺术学院 School of Design&Arts
140100	集成电路科学与工程 Integrated Circuit Science and Engineering	集成电路与电子学院 School of Integrated Circuits and Electronics
0202J1	国民经济动员学（经济学） National Economy Mobilization	管理与经济学院 School of Management and Economics
1201J2	国民经济动员学（管理学） National Economy Mobilization	管理与经济学院 School of Management and Economics
0202J2	能源与气候经济（经济学） Energy Economics and Climate Policy	管理与经济学院 School of Management and Economics
1201J3	能源与气候经济（管理学） Energy Economics and Climate Policy	管理与经济学院 School of Management and Economics

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# Beijing Institute of Technology Graduate Program 2022 for International Students

## 北京理工大学 2022 版留学研究生

### 培养方案框架要求

(理工类)

#### 1. Overview of the Program

英文介绍（下同）。

#### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

#### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	

**Beijing Institute of Technology Graduate Program 2022**

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master $\geq 2$ Ph.D. $\geq 2$
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
	1701007	Modern Regression Techniques in Data Sciences 现代回归方法	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	各学科自行设置				1/2	Optional	Master/Ph.D.	Master $\geq 2$ Ph.D. $\geq 2$
Major Optional Course	各学科自行设置				1/2	Optional	Master/Ph.D.	Master $\geq 6$ Ph.D. $\geq 2$
Total Credits	Master $\geq 24$ credits      Ph.D. $\geq 20$ credits							

**Notes:**

1).Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

2) Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

3) Discipline Core Course

Different Programs can set their own Discipline Core Course.

4) Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.



## 5. Practice Part

### 1) Academic Activity (1 credits)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

### 2) Innovative Practice (1 credits)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferment of Beijing Institute of Technology*

### Time nodes of relevant procedure

The Dissertation Related Work	Master	Ph.D.
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Beijing Institute of Technology Graduate Program 2022 for International Students

## 北京理工大学 2022 版留学研究生

### 培养方案框架要求

(人文类)

#### 1. Overview of the Program

英文介绍（下同）。

#### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

#### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	

### Beijing Institute of Technology Graduate Program 2022

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Basic Course		各学科自行设置			1/2	Optional	Master /Ph.D.	Master $\geq 2$ Ph.D. $\geq 2$
Discipline Core Course		各学科自行设置			1/2	Optional	Master /Ph.D.	Master $\geq 2$ Ph.D. $\geq 2$
Major Optional Course		各学科自行设置			1/2	Optional	Master /Ph.D.	Master $\geq 6$ Ph.D. $\geq 2$
Total Credits	Master $\geq 24$ credits      Ph.D. $\geq 20$ credits							

#### Notes:

##### 1).Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

##### 2) Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

##### 3) Major Course

###### (1) Major Core Courses

Different Programs can set their own Major Core Course.

###### (2) Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

## 5. Practice Part

### 1) Academic Activity (1 credits)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2) Innovative Practice (1 credits)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

### Time nodes of relevant procedure

The Dissertation Related Work	Master 硕士	Ph.D. 博士
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Theoretical Economics

## 理论经济学

(020100)

### 1. Overview of the Program

The discipline of theoretical economics summarizes the general law of economic performance and development, under the guidance of the Marxist economics. The study areas of theoretical economics mainly include: (1) the law of development of human socioeconomic activities and its social formation, (2) the history of economic development and the evolution and innovation of economic thought, and (3) the major characteristics and basic properties of economic activities through the abstract analysis and whole synthesis of the empirical realities. Hence, the discipline of theoretical economics aims to provide the theoretical foundation and system for the concrete analysis and explanations of economic system and performance.

The discipline of theoretical economics in Beijing Institute of Technology was formally conducted by the Teaching and Research Section of Political Economy established in 1953. In 2001, the department was approved to grant the master degree of political economics. In 2010, the department was approved to grant the master degree of theoretical economics. Currently, a group of faculty members with competitive research competence undertake a series of key research projects related with the political economics, resource and environmental economics, and western economics, which develops a good study and research environment for the graduate students.

### 2. Training Target

The target is to train high-level talents who have a good knowledge of theories of economics, a sense of social responsibility and relatively strong innovative ability. The trained talents are expected to master an integrated theoretical system of economics and the history of the development of economics, independently conduct academic research, and be qualified for work at the relevant governmental sectors, research institutions, and enterprises.

### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years.

#### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master	Master=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master	
Basic Courses	2200055	Advanced Econometrics 高级计量经济学	48	3	1	Optional	Master	Master≥3
Discipline Core Course	2200011	Advanced Political Economy 高级政治经济学	48	3	1	Optional	Master	Master≥7
	2200065	Advanced Microeconomics 高级微观经济学	32	2	1	Optional	Master	
	2200057	Advanced Macroeconomics 高级宏观经济学	32	2	2	Optional	Master	
Major Optional Course	2200059	Optional Readings of On Capital 《资本论》专题	32	2	2	Optional	Master	Master≥10
	2200124	Topics on Finance 金融学专题	32	2	1	Optional	Master	
	2200129	Topics on Capital Market 资本市场专题	32	2	2	Optional	Master	
	2200062	Topics on Contemporary Chinese Economy 当代中国经济专题	32	2	2	Optional	Master	
	2200063	Topics on Enterprise Economics 企业经济学专题	32	2	2	Optional	Master	
	2200064	Topics on Economic Thought 经济思想专题	32	2	1	Optional	Master	
	2200120	Topics on Development Economics 发展经济学专题	32	2	2	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Major Optional Course	2200066	The Theme of Socialist Political Economy with Chinese Characteristics 中国特色社会主义政治经济学专题	32	2	2	Optional	Master	Master≥10
	2200067	Selected Readings in Economics Literature 经济学文献选读	32	2	2	Optional	Master	
	2200068	Economics Writing 经济学论文写作	16	1	1	Optional	Master	
	2201001	Topics on Environmental Economics 环境经济学专题	32	2	2	Optional	Master	Master≥2
Total Credits	Master≥36							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2. Major Optional Course

International students should choose courses from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training

period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time Nodes of Relevant Procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester
Mid-Term Evaluation	——
Thesis Defense	At least 9 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference and Lecturer Introduction.



# Applied Economics

## 应用经济学

### (020200)

#### 1. Overview of the Program

The Department of Applied Economics was founded in 1993 as the international trade sub discipline under the Master of Business Administration. In 2004, it obtained the right to grant Master of International Trade. In 2007, it obtained the right to grant Master of Applied Economics. In 2010, it obtained the right to grant Doctor of Applied Economics. After more than ten years of development, especially under the support of the Ministry of Education's "985 Phase II Project" philosophy and social science innovation base, the discipline has entered a stage of rapid development, and the level of scientific research and teaching has improved significantly. In the evaluation of applied economics among 68 colleges and universities published by the Center for Academic Degrees and Postgraduate Education of the Ministry of Education on February 16, 2009, our university ranked 25th in the country, 8th in Beijing, 7th in national science and engineering institutions, and 4th in Beijing's science and engineering institutions. In 2015 the doctorate authorization point of applied economics passed the special qualification assessment of the Ministry of Education. The main research directions of this discipline are:

1. Industrial economic theory and policy: With the rapid economic growth and economic restructuring in China, industrial safety and its corresponding food, ecological and environmental security, strategic emerging industry development and security are under high strategic demand of the country in the new situation. The discipline focuses on the research of relevant theories, strategies, and policies related to the needs of these countries, and provides theoretical and political support for the country to formulate major industrial strategies and policies.
2. International trade and multinational operations: Adhering to the national policy of opening to the outside world, promoting the development of the country's international trade, and accelerating the "going out" of domestic enterprises are important requirements for the sustainable development of the national economy and national economic security in the future. This research area uses the combination of theoretical research and empirical research, qualitative analysis and quantitative analysis to study the theory and policies of international trade and multinational operations, it provides theoretical basis and policy suggestions to deepen our participation in economic globalization, increase the breadth and depth of opening to the outside world, As well

as to implement the “The Belt and Road” initiative.

3. Financial markets and financial innovation: The direction of international financial risk management under applied economics will be based on finance, management science and engineering, probability theory and mathematical statistics and encourage interdisciplinary cooperation with other colleges, integrate research strengths, and develop science and technology.

4. National defense economy and security warning: The direction of national defense economy is mainly based on the study of national economy mobilization, and the research strength is strong. Academic leaders and key teachers have long been engaged in the work of national economic mobilization and safety early warning. They have achieved fruitful results. Among them, they are in the leading position in the field of national economic mobilization.

5. Quantitative economic theory and application: Research on economic quantitative relationships and their changing characters. The study of economic quantitative relations through economic mathematical models is a feature of quantitative economics.

## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge. Students should master the solid foundational theories and systems expertise of applied economics disciplines, with the ability to engage in scientific research independently.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

## 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	2101008	Intermediate Econometrics 中级计量经济学	32	2	1/2	Optional	Master	Master≥2 Ph.D.≥2
	2101010	Advanced Econometrics 高级计量经济学	32	2	1/2	Optional	Ph.D.	
Discipline Core Course	2101009	Macroeconomics 宏观经济学	32	2	1/2	Compulsory	Master/Ph.D.	Master≥2 Ph.D.≥2
	2101001	Intermediate Microeconomics 中级微观经济学	32	2	1/2	Compulsory	Master	
	2101002	Advanced Microeconomics 高级微观经济学	32	2	1/2	Compulsory	Ph.D.	
Major Optional Course	2101012	International Trade 国际贸易理论与政策	32	2	1/2	Optional	Master	Master≥6 Ph.D.≥2
	2101013	Development Economics 发展经济学（管理）	32	2	1/2	Optional	Master	
	2101014	Intercultural Management 跨文化管理	32	2	1/2	Optional	Master	
	2101015	Laws and Regulations of the World Trade Organization 世界贸易组织法律法规	32	2	1/2	Optional	Master	
	2101016	International Finance 国际金融学	32	2	1/2	Optional	Master	
	2101017	Selective Readings in Energy Economics and Climate Policy 能源与气候经济文献选读	32	2	1/2	Optional	Master	
	2101004	Efficiency and Productivity Analysis of Energy and Environment	32	2	1/2	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Major Optional Course		能源环境效率与生产率分析						Master≥6 Ph.D.≥2
	2101005	Industry Green Management and Optimization 行业绿色管理及优化	32	2	1/2	Optional	Master	
	2101018	Classic Literature on International Trade 国际贸易经典文献	32	2	1/2	Optional	Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Basic Course

Different Programs can set their own Major Basic Course.

## 3. Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4. Major Optional Course

International students should choose courses from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training

period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

### Time nodes of relevant procedure

The Dissertation Related Work	Master	Ph.D.
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Law

## 法学

### (030100)

## 1. Overview of the Program

The School of Law adheres to the "Law + Technology" training model, and cultivates high-level, international, and interdisciplinary legal talents. The School of Law now provides Master and Ph.D. program of International Law.

Based on BIT's advantage in science and technology in national defense field, School of Law has developed expertise on subjects of International Law, especially Space Law. Its Space Law program holds a leading position in China and has a great reputation in the international space law community. The "National Administration of Space Law Center" was established in BIT in 2016.

The faculty and staff at School of Law are an energetic group comprised of teachers with vast experience. The school invites approximately 50 guest professors from domestically and internationally well-known law schools, judicial originations, procurator's departments and law firms and department of legal practice. In order to improve the quality of education and research, the School of Law established a collaborative relationship with Renmin University of China School of Law and other well-known universities from United States, Germany, Netherlands, Great Britain and many other nations.

International Law focuses on International Human Rights Law, Public International Law, International Economic Law, International Space Law, Comparative Contract Law, and Immigration Law etc. Economic analysis of Law focuses on the economic analysis of legal system and legal practice. It suggests to make use of economic principles and methods, especially cost and profit, to analyze legal system and legal issues.

## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international social practices, with the ability of linking Chinese and foreign cultures, so as to bring international graduate students into full play as a cultural bridge.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses

in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years.

The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	2301001	Principles of Public International Law 国际法原论	32	2	2	Compulsory	Master/Ph.D.	Master≥1 Ph.D.=2
	2301002	Legal Research and Writing 法律文献与写作	16	1	1	Compulsory	Master	
Discipline Core Course	2301003	International Space Law 国际空间法专题	32	2	1	Compulsory	Master/Ph.D.	Master=4 Ph.D.≥2
	2301004	International Economic Law 国际经济法研究	32	2	2	Compulsory	Master/Ph.D.	
Major Optional Course	2301005	Industrial Property Rights Frontier Issues 工业产权法前沿问题研究	32	2	2	Optional	Master/Ph.D.	Master≥8 Ph.D.≥2
	2301006	International Immigration Law 国际移民法	32	2	1	Optional	Master	
	2301007	Comparative Contract Law 比较合同法	32	2	2	Optional	Master	
	2301008	Comparative Procedure Law 比较诉讼制度	32	2	1	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course	2301009	International Human Rights Law 国际人权法专题	32	2	2	Optional	Master	Master≥8 Ph.D.≥2
	2301010	Law of International Organizations 国际组织法专题	32	2	2	Optional	Master	
	2301011	Frontier Issues of Tort Liability Law 侵权责任法前沿问题	32	2	1	Optional	Master	
Total Credits	Master≥27 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Basic Course

Different Programs can set their own Basic Course.

## 3. Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4. Major Optional Course

International students should choose courses from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)



International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Degree Awarding Regulations of BIT*

**Time Nodes of Relevant Procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference and Lecturer Introduction

# Education

## 教育学

(040100)

### 1. Overview of the Program

Education is a discipline that studies the pedagogical phenomena and issues in human world, and reveals the law of education and its applicational characteristics. It is a knowledge system gradually formed in the process of summarizing the practical experience of education and developed through long-term research and accumulation. Education mainly involves the relationship in human growth, development and learning, and educational activities. It also refers to the development and organization of learning and educational activities, the relationship between education and society, and the law of educational reform and development.

The education discipline of Beijing Institute of Technology has been established since 1981. In 1998, it was approved to be a master's degree of higher education. In 2005, it was approved to be a master's degree of economics and management of education. In 2006, it was authorized to be a master's degree of education. In 2011, it was authorized to be a doctor's degree of education. In the same year, it was approved to be a master's professional degree of education. The current research directions include higher education, economics and management of education, graduate education, educational technology, and education culture and society.

### 2. Training Target

The target is to cultivate senior professionals with comprehensive development of morality, intelligence and physique, solid theoretical foundation of educational science, corresponding research methods and systematic expertise, a deeper understanding of educational practice, a good command of a foreign language, and a strong ability of educational research and computer application. The graduates would be able to engage in educational management, professional teaching, scientific research, human resource management and training, educational technology management and services in government agencies, schools, scientific research institutions, the military and other enterprises and institutions.

### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Courses Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700005	Chinese Language I 基础汉语 I	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	2200161	Research on General Secretary Xi Jinping's Important Remarks of Education 习近平总书记教育重要论述研究	32	2	1	Optional	Master	Master $\geq$ 2 Ph.D. $\geq$ 2
	2200150	Pedagogics 教育基本理论	32	2	1	Optional		
	2200151	Advanced Studies in Higher Education 高等教育研究前沿	32	2	1	Optional	Ph.D.	
Discipline Core Course	2200152	Educational Research Methods 教育研究方法	32	2	2	Optional	Master.	Master $\geq$ 2 Ph.D. $\geq$ 2
	2200153	The History of Chinese and Foreign Education 中外教育史	32	2	1	Optional		
	2200078	Educational Organization and Management 教育组织与管理	32	2	1	Optional		
	2200079	Education Policy 教育政策学	32	2	1	Optional		
	2200080	Fundamentals of Graduate Education 研究生教育学基础	32	2	1	Optional		
	2200069	Sociality and Personality Development 社会性与人格发展	32	2	2	Optional		

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
	2200071	Educational Philosophy 教育哲学	32	2	2	Optional		
	3300001	Educational Technology 教育技术学	32	2	1	Optional		
	2200077	Higher Educational Economics and Management Frontiers 高等教育经济与管理前沿	32	2	1	Optional	Ph.D.	
Major Optional Course	2200082	Economics of Education 教育经济学	32	2	1	Optional	Master.	Master $\geq 6$ Ph.D. $\geq 2$
	2200083	Education Statistics 教育统计学	32	2	2	Optional		
	2200160	Theory and Practice of Innovation and Entrepreneurship 创新创业的理论与实践	32	2	2	Optional		
	2200086	Writing and Communication Skills 写作与交流沟通能力	32	2	2	Optional		
	2200087	Special Subject of Pedagogy 教育学专题	32	2	2	Optional		
	2200070	Development and Educational Psychology 发展与教育心理学专题	32	2	2	Optional		
	2200050	Special Research Themes on Mental Health 心理健康专题研究	32	2	1	Optional		

Course Classification	Course Code	Course Name	Cours e Hours	Credits	Semes ter	Compulsory/ Optional	Master /Ph.D.	Credits Requirement
	2200154	Sociology of Education 教育社会学	32	2	1	Optional		
	2200155	Introduction to Engineering Education 工程教育导论	32	2	2	Optional		
	2200156	Design and Practice of Educational Research 教育研究设计与实践	32	2	2	Optional		
	2200157	Educational Evaluation 教育评价学	32	2	1	Optional		
	2200158	Monographic Study on Science Education 科学教育专题研究	32	2	1	Optional		
	2201094	Global Issues in Education (英) 全球教育热点	32	2	1	Optional		
	2201095	International Education Reform and Student Development (英) 国际教育改革与学生发展	32	2	1	Optional		
	2200043	Special Topic on Methodology of Social Science Research 社会科学研究方法论专题	32	2	1	Optional	Ph.D.	
	2200089	The Frontier of Modern Learning Science 当代学习科学发展前沿	32	2	1	Optional		

Course Classification	Course Code	Course Name	Cours e Hours	Credits	Semes ter	Compulsory/ Optional	Master /Ph.D.	Credits Requirement
	2200088	Frontiers of Soft Science Methodology and Education Policy 软科学方法与教育 政策前沿	32	2	2	Optional		
	2200090	Frontiers of Educational Technology 教育技术前沿	32	2	1	Optional		
	2200159	Special Topic of Educational Reform and Development 教育改革与发展专 题	32	2	2	Optional		
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1) Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2) Basic Course

Different programs can set their own Basic Course.

## 3) Major Course

## (1) Discipline Core Course

Different programs can set their own Discipline Core Course.

## (2) Major Optional Course

International students should choose course from their own program or from other programs. When credits of Basic Courses or of Discipline Core Courses international students take are more than 2, the excess could be registered as Major Optional Courses' credits. Under the guidance of the supervisor, International master international students can take undergraduate courses if needed. International Ph.D. students can take undergraduate courses if needed.

## 5. Practice Part

### 1) Academic Activity (1 credits)

International graduate students need to participate in academic activities, academic lectures and academic conferences of their own fields. Presenting oral speeches on academic conferences, whether on or off campus, is highly recommended.

### 2) Innovative Practice (1 credits)

International graduate students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Master of Teaching Chinese to Speakers of Other Languages

## 汉语国际教育

(045300)

### 1. Overview of the Program

Master of Teaching Chinese to Speakers of Other Languages (MTCSOL), a professional degree that sets up for promoting Chinese to reach the world and meeting the great demand of overseas Chinese teachers, aims to link up with international Chinese teacher profession and to accelerate the development of cultivation system of teacher localization.

### 2. Training Target

The program of Master of Teaching Chinese to Speakers of Other Languages (MTCSOL) aims to cultivate internationalized professional masters who are acquainted with China and Chinese culture. The postgraduates of this program should be equipped with solid knowledge of Chinese language and culture teaching skills and be qualified for teaching Chinese as a second language. The person who gets the degree is supposed to master the systematic teaching skills of Chinese as a second language, to possess professional competence and strong professional sense and be capable of intercultural communication.

A combined approach of course study and professional practice is applied to the program of MTCSOL, including the union of Chinese international education and Chinese cultural communication, and the cooperation of supervision from both supervisors and internship instructors.

### 3. Length of Schooling

The normative time for full-time postgraduates is 2 years. The first two terms are for the study of courses. The first term of the second year is for the educational practice at their home countries or at the Office of International Students of Beijing Institute of Technology.

### 4. Curriculum and Credits Requirements

Course Type	Course Code	Course Name (Chinese)	Period	Credits	Term	Compulsory/ optional	Remarks
Basic Courses	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	common courses≥5 credits
	2400199	Modern Chinese Language 现代汉语	48	3	1	Compulsory	



Course Type	Course Code	Course Name (Chinese)	Period	Credits	Term	Compulsory/ optional	Remarks
Compulsory Courses	2400230	Teaching Chinese as a Second Language 汉语作为第二语言教学	64	4	1	Compulsory	Core Courses $\geq 12$ credits
	2400197	Chinese Culture and Communication 中华文化与传播	32	2	1	Compulsory	
	2400180	Theory and Practice of Intercultural Communication 跨文化交际理论与实践	32	2	1	Compulsory	
	2400149	Second Language Acquisition 第二语言习得	32	2	1	Compulsory	
	2400152	Case Analysis of Oversea Chinese Teaching 国外汉语课堂教学案例分析	32	2	2	Compulsory	
	2400154	Methodology of Chinese as a Second Language 汉语教学研究方法	16	1	2	Compulsory	Training Courses $\geq 4$ credits
	2400202	Chinese Language Testing 汉语语言测试	32	1	1	Compulsory	
	2400159	Training of Talent on Chinese Culture 中华文化才艺与展示	16	1	2	Compulsory	
	2400195	Chinese Teaching Resources and Utilization 汉语教学资源及其利用	16	1	2	Compulsory	
Optional Courses	2400200	Advanced Chinese Writing 高级汉语写作	32	2	1	Optional	Extension Courses $\geq 8$ credits

Course Type	Course Code	Course Name (Chinese)	Period	Credits	Term	Compulsory/ optional	Remarks
Optional Courses	2400196	Fundamentals of Chinese language Teaching 汉语要素教学	32	2	1	Optional	Extension Courses ≥ 8 credits
	2400151	Comparative Linguistics and the Comparison of Chinese and Other Languages 汉外语言对比	32	2	1	Optional	
	2400150	Education Psychology of Foreign Languages 外语教育心理学	32	2	2	Optional	
	2400226	Modern Education Technology for Chinese Language 现代语言教育技术	32	2	1	Optional	
	2400198	Academic Writing 汉语国际教育专业论文写作	16	1	2	Optional	
	2400201	Chinese Lexicological Culture 汉字文化	16	1	2	Optional	
	2400182	Research of Chinese Grammar 汉语语法专题研究	16	1	2	Optional	
	2400268	Listening and Speaking for Advanced Chinese Learners 高级中文听说教程	48	3	2	Optional	

**Notes:**

For international students: total credits of courses including common courses, compulsory courses, optional courses and teaching practice should be no less than 36 credits, seeing details below.

Basic courses: 5 credits (Overview of China: 2 credits; Modern Chinese Language: 3 credits)

Compulsory courses: 16 credits (Core courses + Training courses)

Optional courses: 9 credits (Extension courses)

Teaching Practice: 6 credits

## 5. Practice Part

Master students are required to participate in international Chinese teaching and intercultural communication, in which they are required to write a plan for the teaching practice and a report within 3000 words. In addition two cases are required in terms of Chinese instruction or intercultural communication. These should be submitted together with the assessment by the employer at the end of the teaching practice. All the international students are required to practice Chinese teaching either at the Confucius institute in their domestic countries or at the Office of International Students in Beijing Institute of Technology.

## 6. The Dissertation Related Work

All the Master students should participate in academic lectures no less than 8 times and write 4 lecture reports concerning lectures' content and academic views and arguments.

### 6.1 Literature review and thesis proposal

All the postgraduates should conduct thesis proposal at the end of the second term after reading academic 20 articles or books and accomplishing a literature review based on the reading in 3000 words.

A thesis proposal should focus on literature review, research objectives and significance, implement scheme, schedule, and expected results. The research topic should be closely related to international Chinese teaching practice and should have strong application value.

### 6.2 The progress report

The progress report is examined by the supervisor group, and should be completed by the middle of the third term (for the local internship) or the middle of the forth term (for the international internship)

### 6.3 Thesis writing

Directed by the supervisor, postgraduates should accomplish the required credits and processes of thesis proposal, writing thesis, applying and getting approval of thesis defense independently under the guidance of the supervisor. The thesis can be issue research, investigation report, educational experiment report, case analysis, teaching design etc. The thesis should reach the required level of originality and include no less than 20,000 characters. The criterion of thesis assessment focuses on the internalization of theories and methodology and abilities of analyzing and solving practical problems. It is encouraged to involve research results with new insights and practical value.

#### 6.4. Thesis defenses

All the procedures of thesis defense should follow the “Regulation of Professional Degree Awarding of Beijing Institute of Technology” .

#### 6.5 Degree Conferment

After accomplishing the required credits, approved by the supervisor, the postgraduates engage into the thesis review and oral defense. The time interval between thesis proposal and thesis defense should be at least 9 months. Academic achievement publication should be in accordance with

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*.

**Time Nodes of Relevant Procedure**

<b>Cultivation Stages</b>	<b>2-years Professional Types of Postgraduate Students</b>
Literature review and thesis proposal	By the first week of the third term
Progress report	By the first two weeks of the fourth term
Thesis defense	At least nine month after thesis proposal
Degree application	After thesis defense within the required time

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents and Reference.

# Mathematics

## 数学

(070100)

### 1. Overview of the Program (学科简介与研究方向)

Mathematics is the science and study of quality, structure, space, and change. It deals with logical reasoning and quantitative calculation, and its development has involved an increasing degree of abstraction of its subject matter. Today, mathematics is used throughout the world as an essential tool in many fields, including natural science, engineering, medicine, and the social sciences. Applied mathematics, the branch of mathematics concerned with application of mathematical knowledge to other fields, inspires and makes use of new mathematical discoveries and sometimes leads to the development of entirely new disciplines.

The School of Mathematics and Statistics at Beijing Institute of Technology (BIT) originates from the Mathematics Teaching and Research Office in the Basic Science Department in the 1960s. The School of Mathematics was founded in 2011, and renamed as the School of Mathematics and Statistics in 2013.

Approved by the Academic Degrees Committee of the State Council, the School was among the first group of institutions that is qualified to confer Ph. D degrees in applied mathematics in 1981, and was approved to confer Ph. D degrees in mathematics in 2010 and Ph. D degrees in statistics in 2011. Its “Applied Mathematics” was approved as a key subject in 2013 by the Ministry of Industry and Information Technology. The laboratory on “Mathematical Characterization, Analysis and Applications of Complex Information” was acknowledged as a Beijing key laboratory in 2015. The Mathematics subject has been in the top 1% according to the Essential Science Indicators (ESI) since 2021. According to the QS World University Rankings by Subject in 2021, the rank of Mathematics subject in BIT is 201-250.

Currently, there are 69 faculty members working on mathematics, including 23 professors, 28 associate professors and 22 assistant professors. Among them, there are two winners of the National Natural Science Foundation for Distinguished Young Scholars, 2 Changjiang Scholar Chair Professors acknowledged by the Ministry of Education (1 of them is a fellow of the American Mathematical Society, and both of them are fellows of the Institute of Mathematical Statistics), 5 scholars supported by the Program for New Century Excellent Talents of the Ministry of Education, and 2 winners of the “Beijing Outstanding Teacher Award”. After more than 30 years of development, the following 5 preponderant research fields stand out:

- 1) Algebra and Representation Theory

- 2) Geometry, Topology and Analysis
- 3) Differential Equations and Their Applications
- 4) Graph Theory and Combinatorial Optimization
- 5) Computation, Mechanics and Control Theory

### **(1) Algebra and Representation Theory**

This discipline focuses on structures and theories related to algebraic groups, quantum groups, Lie algebras, cyclotomic Hecke algebras, Hecke-Clifford algebras and non-commutative Iwasawa algebras. More specifically, this field of study covers the modular representation of semisimple algebraic groups, integral Schur-Weyl duality between classical groups of types BCD or their quantum groups and the Brauer algebras or BMW algebras, respectively, modules for the cyclotomic Hecke algebras of type  $G(r,p,n)$ ,  $\mathbb{Z}$ -graded representation theory of quiver Hecke algebras, spin symmetric groups and Hecke-Clifford algebras, queer Schur superalgebras,  $Q$ - $q$ -Schur superalgebras, affine and cyclotomic Yokonuma-Hecke algebras, reflexive ideals in Iwasawa algebras, derivations of generalized matrix algebras, Lie algebras and vertex operator algebras, cluster algebras, gentle algebras, classical groups over rings and coding theory.

### **(2) Geometry, Topology and Analysis**

This discipline focuses on differential geometry, topology, complex analysis, operator algebras theory, etc. More specifically, this field of study covers geometric flows in Riemannian and complex geometry, geometry and topology of manifolds, hypersurface geometry; fuzzy topological theories, including theories for lattice-valued measures, pointwise approach, separation axioms and fuzzy compactness; operator algebras theory, Lie algebras of operator and their applications in physics and operator spectral theory; and deformation theory of Kleinian groups.

### **(3) Differential Equations and Their Applications**

This discipline focuses on definite solutions for evolution equations such as their well-posedness and asymptotic behavior, eigenvalue problems for nonlinear elliptic partial differential equations, well-posedness of Boltzmann equations and scattering theory for dispersive partial differential equations, as well as their applications in automatic control, image processing, bioscience and life science, etc.

### **(4) Graph Theory and Combinatorial Optimization**

This discipline studies graph structures, conditions for the existence of a factor and its extreme value, coloring, parameters and chemical index, random graphs and their applications; as well as fuzzy matroids and fuzzy optimization and applications of their mathematical models and optimization methods into engineering design,

network flows, economic management of transportation, logistics and supply chains, etc.

### **(5) Computation, Mechanics and Control Theory**

Capitalizing on the advantage interdisciplinary studies, this discipline is based on practical problems in engineering sciences, mechanics, materials science, automation, etc. and focuses on universal and key scientific issues, such as control theory, High Performance Computing (HPC) and fluid mechanics. The study covers control theory, distributed parameter systems, nonlinear systems, stochastic systems, optimal control, geometric control, scientific computation, finite element methods, multiscale analysis, wavelet transform computation, general mechanics and Computational Fluid Dynamics (CFD).

## **2. Training Target**

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

We are aimed to produce graduate students who have a national sense of mission and the social sense of responsibility, law-abiding, decency, honesty and trustworthiness, physical and mental health, rich scientific spirit and international perspective to the high-quality, high-level creative talents. The graduate students should have the ability to engage in basic theory and application research in the field of mathematics, have a rigorous and realistic style of work and learning attitude, and have a high professional English reading ability.

Master students should master the solid basic theory and systematic knowledge of the discipline, and have the ability to engage in scientific research work or independent specialized technical work.

Doctoral students should master the solid basic theory and systematic knowledge of the discipline, and have the ability to work independently in scientific research, and make creative achievements in science and technology.

## **3. Length of Schooling**

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

## 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1700127	Functional Analysis (Module I) 泛函分析 (模块 1)	64	4	1	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1700128	Functional Analysis (Module II) 泛函分析 (模块 2)	16	1	1	Optional	Master/Ph.D.	
	1700129	Algebras (Module I) 代数学 (模块 1)	48	3	1	Optional	Master/Ph.D.	
	1700130	Algebras (Module II) 代数学 (模块 2)	32	2	2	Optional	Master/Ph.D.	
	1700131	Topology (Module I) 拓扑学 (模块 1)	48	3	1	Optional	Master/Ph.D.	
	1700132	Topology (Module II) (英) 拓扑学 (模块 2)	32	2	2	Optional	Master/Ph.D.	
	1700105	Modern Partial Differential Equations 现代偏微分方程	48	3	1	Optional	Master/Ph.D. 硕博	
Discipline Core Course	1700104	Riemannian Geometry 黎曼几何	48	3	1	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1700106	Advanced Probability Theory 高等概率论	48	3	2	Optional	Master/Ph.D.	
	1701146	Modern Optimization Methods (英) 现代优化方法	48	3	2	Optional	Master/Ph.D.	



Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
	1701148	Introduction to algebraic geometry and algebraic groups (英) 代数几何	32	2	1	Optional	Master /Ph.D.	
Major Optional Course	1700107	Graph Theory and Its Applications 图论及其应用	48	3	1	Optional	Master /Ph.D.	Master $\geq$ 6 Ph.D. $\geq$ 2
	1700116	Advanced Mathematical Statistics 高等数理统计	48	3	2	Optional	Master /Ph.D.	
	1700159	Advanced Stochastic Processes 高等随机过程	48	3	1	Optional	Master /Ph.D.	
	1700111	Control Synthesis Theory 控制综合理论	32	2	2	Optional	Master /Ph.D.	
	1701113	Theory of Semigroup of Operators and Application (英) 算子半群理论及应用	32	2	1	Optional	Master /Ph.D.	
	1700114	Finite Element Methods 现代有限元方法	32	2	2	Optional	Master /Ph.D.	
	1700115	Mathematical Methods in Information Analysis 信息分析中的数学方法	32	2	2	Optional	Master /Ph.D.	
	1700133	Stochastic Differential Equations 随机微分方程	48	3	2	Optional	Master /Ph.D.	
	1700149	Homological Algebras 同调代数	32	2	1	Optional	Master /Ph.D.	
Total Credits	Master $\geq$ 24 credits      Ph.D. $\geq$ 20 credits							

**Notes:**

## 1).Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

**5. Practice Part**

## 1) Academic Activity (1 credits)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2) Innovative Practice (1 credits)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

**6. The Dissertation Related Work**

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

The qualified candidates for master's degree and doctor's degree will be granted the degree of master of science and doctor of science respectively.

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report

The Dissertation Related Work	Master	Ph.D.
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Physics

## 物理学

### (070200)

#### 1. Overview of the Program

Physics studies the structure, interaction and movement laws of matter and their various practical applications. It is the foundational subject for all disciplines of natural science and a major source of science and technology. The Subject of Physics in BIT has the right to grant master's degree and doctor's degree of first-level discipline. Currently, the School of Physics is well staffed with 105 teachers, with 54 professors and 50 associate professors, 62 Ph.D. supervisors and 93 master's supervisors. Our teachers have strong scientific research strength, and have published more than 200-SCI papers every year, with an average annual funding of about 20 million yuan. We have won several national and provincial awards such as the Second Prize and Third Prize of the National Natural Science, the First Prize of National Defense Science and Technology, and the Second Prize of the Natural Science of the Ministry of Education by now. Since 2012, the subject has entered the top 1% of ESI's global rankings. In the QS World University Rankings of 2022, the School of Physics of Beijing Institute of Technology successfully entered the top 300 universities in the world, ranking "251-300" in the "Physics and Astronomy" discipline, ranking 5th in the discipline of Applied Physics mainland China universities. Beijing Institute of Technology physics academic graduate training program mainly includes the following research directions: theoretical physics and applications, condensed matter physics, optics, computational physics and so on:

1. Theoretical physics and applications: including basic theoretical issues related to quantum information, Condensed matter strong correlation theory, cosmology and high energy physics, theoretical biophysics.
2. Condensed matter physics: including condensed matter theory, elementary excitation in condensed matter physics, quantum transport, nanoscale physical properties, spintronics and new solid quantum device design, quantum materials, etc. Focusing on the structure-effect relationship between small molecules and macroscopic particle aggregate construction principles, methods, microstructures, and structures and properties, researching and exploring the nonlinear response, self-organization, ordering and rheology of soft materials under various external influences and key issues in application.
3. Optics: including light-substance interactions, nanophotonics, quantum optics, and optical quantum informatics. The interaction between light and matter mainly explores the interaction between light and quantum

wires, quantum dots, quantum plates, photonic crystals, metal nanostructures, mesoscopic superconducting devices, optical superlattices and other artificial structural materials from both theoretical and experimental aspects. Nanophotonics is a discipline that studies the interaction of electrons and photons in nanostructures and their devices. It is a new discipline developed by the integration of photonics technology and nanoelectronics technology, and will be developed in the direction of nanophotonics integration. Quantum optics and optical quantum informatics mainly carry out quantum imaging and ghost imaging, optical quantum computing, optical quantum communication, optical quantum sensing and so on.

4. Computational physics: Develop computational methods based on quantum mechanics, develop corresponding high-performance parallel computing software packages; study various new functional materials, especially topological materials, two-dimensional quantum materials, nano photoelectronic materials, Renewable energy materials, Defective material, energy-containing materials, application of material and plasma physics in military and commercial technology, amorphous and quasicrystals, design and application of conductive materials and optoelectronic materials.

## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

The Physics master degree candidates should have a solid foundation of the basic theory and professional knowledge in the field of physics, master modern experimental method and techniques in physics, have the capability of organization and administration of scientific research and engineering, have good spirit of cooperation and strong communication skills, have good command of listening and speaking in English, be good at reading professional literature and writing English thesis of related field. Candidates will be developing in every way morally intellectually and physically and will be competent for teaching and scientific research in physics and related field.

The Physics doctor degree candidates should have a solid foundation of the basic theory and professional knowledge in the field of physics, master modern experimental method and techniques in related field, demonstrate continuous and effective engagement in independent and creative research activity of high quality and significance, have good spirit of cooperation and strong communication skills, have good command of listening and speaking in English, be good at reading professional literature and writing English thesis of related field, make creative achievements in scientific research and specialized technology. Candidates will be

competent for teaching, scientific researching, developing and project administrating in colleges, universities and high-tech enterprises.

### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

### 4. Curriculum and Credits Requirements

Course Classification 类别	Course Code 课程代码	Course Name 课程名称	Course Hours 学时	Credits 学分	Semester 学期	Compulsory/ Optional 是否必修	Master /Ph.D. 课程 层次	Credits Requirement 学分要求
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master /Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master /Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master /Ph.D.	
Basic Course	1801001	Advanced Quantum Mechanics 高等量子力学	64	4	1	Compulsory	Master /Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
Discipline Core Course	1801005	Modern Optics 现代光学	64	4	1	Compulsory	Master /Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
Major Optional Course	1801003	Introduction to quantum information 量子信息引论	32	2	1	Optional	Master /Ph.D.	Master $\geq$ 6 Ph.D. $\geq$ 2
	1801004	Surface Physics and Surface Analysis 表面物理与表面分 析	32	2	2	Optional		
	1801006	Thin Film Science	32	2	2	Optional		

Course Classification 类别	Course Code 课程代码	Course Name 课程名称	Course Hours 学时	Credits 学分	Semester 学期	Compulsory/ Optional 是否必修	Master /Ph.D. 课程 层次	Credits Requirement 学分要求
		and Technology 薄膜科学与技术						
Total Credits	Master $\geq 24$ credits      Ph.D. $\geq 20$ credits							

**Notes (说明):**

## 1).Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2) Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3) Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4) Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1) Academic Activity (1 credits)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2) Innovative Practice (1 credits)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

**6. The Dissertation Related Work**

1. Literature Review & Opening Report ; 2. Mid-Term Evaluation ; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	----	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	----	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.



# Chemistry

## 化学

(070300)

### 1. Overview of the Program

In recent years, the Chemistry discipline has achieved advanced development, with the international influence rising significantly. According to the ESI evaluation retrieval data of academic influence of subjects, the chemistry program in BIT is ranked within top 1‰. It is also ranked 28<sup>th</sup> among universities in China, which is one of the important bases of chemical scientific research and talents training.

The Chemistry program belongs to a full-time degree program, involving both coursework and projects. It aims to cultivate the high-level specialized personnel with a firm grasp of basic theories and professional knowledge of chemistry, with experimental skills and abilities to solve practical problems. Students are required to participate in projects in relevant fields under the guidance of their supervisors and complete their graduation thesis based on the projects they have conducted. The qualified students will be granted to the master or Ph.D. degrees after obtaining required credits and passing their thesis defense.

### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bond.

### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
	1701007	Modern Regression Techniques in Data Sciences 现代回归方法	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	1001017	Coordination Chemistry 配位化学	32	2	1	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1001018	X-Ray Crystallography X 射线晶体学	32	2	1	Optional	Master/Ph.D.	
	1001003	New Energy Technology 新能源技术	32	2	1	Optional	Master/Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Major Optional Course	1001007	Supramolecular Chemistry 超分子化学	32	2	2	Optional	Master/Ph.D.	Master $\geq 6$ Ph.D. $\geq 2$
	1001021	Heterogeneous Catalysis for Energy Applications 能源应用当中的多相催化	32	2	1	Optional	Master/Ph.D.	
	1001023	Carbon Neutral Chemical Technology 碳中和化工技术	32	2	1	Optional	Master/Ph.D.	
	1001006	Spectrometric Identification of Organic Compound 有机波谱分析	32	2	1	Optional	Master/Ph.D.	
	1001024	Advanced Instrumental Analysis 高等仪器分析	32	2	2	Optional	Master/Ph.D.	
	1001025	Organometallic Chemistry 金属有机化学	32	2	2	Optional	Master/Ph.D.	
	1001026	Fundamentals of Materials Science and Engineering 材料科学与工程基础	32	2	2	Optional	Master/Ph.D.	
Total Credits	Master $\geq 24$ credits      Ph.D. $\geq 20$ credits							

**Notes (说明):**

## 1).Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this

required course.

## 2) Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3) Discipline Core Course

Discipline Core Courses were set by Chemistry Graduate Program.

## 4) Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

# 5. Practice Part

### 1) Academic Activity (1 credits)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

### 2) Innovative Practice (1 credits)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

# 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review

The Dissertation Related Work	Master	Ph.D.
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Biology

## 生物学

### (071000)

## 1. Overview of the Program

School of life science researches started from 1980s in Beijing Institute of Technology, primarily supporting the Master and Doctor Program in applied chemistry. In 1995, department of Biology Engineering was authorized began to recruit master and doctor programs in this major, respectively in 2000 and 2005. For the disciplinary progress of fundamental biology, school of life science was authorized to award degree in biochemistry and molecular biology in 2003, microbiology and neurology in 2005. Furthermore, biochemistry and biology are approved as key discipline of national defense in 2007. Biology was conferred as a first-class discipline and authorized to recruit master and doctor programs in this major, respectively in 2010 and 2019.

So far, there are four principal research orientations in biology first class disciplines: Neurobiology, Biochemistry & Molecular Biology, Microbiology and Cellular Biology. Introductions as follows:

1. Neuroscience: (1) study molecular mechanism of neuronal disease: for neurodegenerative disorders and vascular diseases. To clarify the molecular mechanism, pathology and possible treatment of Parkinson's disease, Alzheimer's Disease, cerebrovascular disease and psychosis via advanced approaches and techniques such as proteomics, biochemical analysis and separation, molecular biology, etc. (2) space neurology and immunology: to investigate the biological alteration its mechanism of nervous system, the interaction between nervous and immune systems and their signaling pathways' changes, nervous system development, neuronal apoptosis caused by oxidative damage and its prevention, neuron stem cells development and its role in repair the nervous system trauma, ergonomic evaluation for space and confined capsule human-machine-environment, fundamental space neurobiology medicine study, etc. (3) research on new technology and approaches for neurobiology: to discuss application of proteomics and metabonomics, new labeling and quantitative technique in neurobiology study. Apply to Biological mass spectrometry, HPLC-MS, two-dimensional electrophoresis techniques in and other nervous system diseases associated protein used in highly sensitive quantitative analysis; proteome level in exploring the etiology of neurological diseases and its regulation. Neurobiological research on the application of nanotechnology, new techniques and methods of labeling, the molecules, cells, and neural elements on the individual level for rapid and sensitive marker, and real-time detection of dynamic trace.

2. Biochemistry & Molecular Biology: (1) structure, function and regulation of biomacromolecules. It focuses on the research on novel drug targets and endogenous pathogenic matter responsible for major human disorders. Structure and molecular design of proteins with specificity function; application of trip-repeat nucleotide fragments in gene expression and regulation. (2) Technology of biochemical analysis and separation. It stresses studies of new approaches and applications of biochemical analysis and separation, including the biology separation medium and ligands development and their use in chromatography realm; application of low abundant protein concentrating technique, High Performance Liquid Chromatography, electrophoresis, capillary electrochromatography in biochemical analysis and separation, drug selection and proteomics; researches on new-type quantum dots and biosensors. (3) Applied chemistry and molecular biology. It aims at the cross disciplinary fields of biology, chemistry, material science, engineering and space biology, including high-sensitive molecular detection technology for nucleic acid, molecular mechanisms of the interaction between biomaterial or bioactivity material between tissue and cells, design and application of biomaterials, aptamer and vectors, etc.

3. Microbiology: (1) Biotransformation and Synthetic Biosystem: Recombination and synthesis of new, specific functional artificial microbial systems by engineering strategies for production applications. Research areas cover microbial metabolism, regulation and its molecular mechanisms, as well as the reorganization of microbial metabolic pathways. (2) Space microbial biotechnology: to study the growth, metabolism and the gene expression mechanism of microorganism under the space condition and explore new methods for drug development and waste clearance in space with the assistance of microorganism. With the researches on space microbe culture techniques, create space culture system suitable for diverse categories of microbes with a measurable and controllable loading style. (3) microorganism metabolism and gene engineering: to research the metabolism, regulation and mechanism of microorganism, reconstruction of microbe metabolism, modification of genetically engineered bacterium, RNA interference in bacterial model, taking advantage of microbe and its enzyme to process and transform some certain substance to ensure the cleanness and efficacy.

4. Cellular and molecular regulation mechanisms and applications:

(1) Effects of Spatial Microgravity and Radiation on the Growth, Differentiation and Function of Different Cells in the Body;

(2) Molecular biological basis and structure-activity relationships of biologically active substances for the prevention and treatment of tumors, neurodegenerative diseases and diabetes; molecular mechanisms of neurological and cardiovascular damage, drug countermeasures and protective measures under conditions of aerospace weight loss; weightless pharmacokinetics and metabolic patterns the study.

After several years of efforts and dedication, school of life science owns a creative, active and cooperative faculty team. They are focusing on the cutting-edged international issues, highlighting the importance of academic communication, making efforts to combine their well-structured knowledge system with practice and contributing to earn national and international influence. Among which, there are 14 professors, 18 associate professors, 18 PhD supervisors and 35 mater supervisors. More than 90% have PhD degree, and 1/3 of them have oversea experience for more than 1 year. Faculties of our school have undertaken many Research Grants, such as the National High Technology Research Grant and Development Program of China Grant (863 Program), the National Basic Research Program of China Grant (973 Program), the National Natural Science Foundations of China (NSFC) and national, provincial and ministerial project of defense pre-research and civil aerospace. There are more than 120 published papers cited by SCI, EI and ISTP per year and there is research space about 3000 square meters with more than 30 large equipment and hundreds of small devices. The total cost of equipment are around 40 millions.

## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

## 4. Curriculum and Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	



Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Basic Course	1601001	Modern Biochemistry 现代生物化学	32	2	2	Optional	Master /Ph.D.	Master $\geq 2$
	1600078	Structural Biology 结构生物学	32	2	1	Optional	Master /Ph.D.	Ph.D. $\geq 2$
Discipline Core Course	1601002	Current Opinion in Life science and Biotechnology 现代生命科学与生物技术述评	32	2	1	Optional	Master	Master $\geq 2$ Ph.D. $\geq 2$
	1600077	Cutting-edge Research Methods in Biology 生物学前沿研究方法	32	2	1	Optional	Ph.D.	
Major Optional Course	1600059	Advance Experimental in Biochemistry and Molecular biology 高级生物化学与分子生物学实验	32	2	2	Optional	Master	Master $\geq 6$ Ph.D. $\geq 2$
	1600035	Modern Neurobiological Technology and Method 现代神经生物技术与方法	32	2	2	Optional	Master	
	1601005	Applied Biopharmaceutics & Pharmacokinetics 实用生物药剂学与药物动力学	32	2	1	Optional	Master	
	1600013	Neurobiology 神经生物学	32	2	2	Optional	Master	
	1600001	Molecular Immunity 分子免疫学	32	2	2	Optional	Master	
	1600017	Protein Engineering and Technology 蛋白质工程与技术	32	2	1	Optional	Ph.D.	
	1600022	Recognition and Detection of Biomedical Molecule 生物医学分子识别及检测	32	2	1	Optional	Ph.D.	
	1600076	Applied Environmental Microbiology 应用环境微生物学	32	2	1	Optional	Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
	1600011	Clinical Test Methods and Instruments 临床检验方法与仪器	32	2	1	Optional	Ph.D.	
Total Credits	Master $\geq 24$ credits      Ph.D. $\geq 20$ credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Basic Course

Different Programs can set their own Basic Course.

## 3. Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4. Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

**6. The Dissertation Related Work**

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time Nodes of Relevant Procedure**

The Dissertation Related Work	Master	Ph.D.
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Biomedical Engineering

## 生物医学工程

(083100)

### 1. Overview of the Program

Biomedical Engineering, a comprehensive and high-tech engineering field, applies the principles and methods of modern natural science and engineering techniques to study the structure, functions, and relationships of the human body to reveal life phenomena and provide prevention and treatment of diseases by new technical means. The areas of biomedical engineering include interdisciplinary science and technology for the purpose of disease prevention, diagnosis, treatment, rehabilitation, etc. Development and application of medical devices and other biomedical engineering products.

The First-level master's degree qualification of biomedical engineering in Beijing institute of technology was authorized in 2003. The First-level disciplines for granting doctoral degrees are authorized in 2011. In 2007, the distinctive direction "Space Biology and Medical Engineering" in biomedical engineering in Beijing institute of technology was approved as the special discipline of national defense. In 2013, the newly established interdisciplinary "integrated medical engineering" was approved as a key discipline of the Ministry of Industry and Information Technology.

So far, we have enrolled more than 200 master graduate students, and more than 200 have graduated. We have recruited nearly 90 Ph.D. students in this discipline and other related fields (bio-chemicals, life information engineering) with qualifications for Ph.D. awards, and nearly 40 have graduated.

There are 3 provincial and ministerial key laboratories, including Beijing Key Laboratory of Biomedical Separation and Analysis, Key Laboratory of Integrated Medical Systems and Health Engineering of the Ministry of Industry and Information Technology, and Beijing Biological Teaching Demonstration Center. The area of research laboratories is about 3,600 square meters. The total value of all equipment exceeds 40 million, including laser scanning confocal microscopy, chromatography-mass spectrometry proteomics platform, microfluidic chip processing system, protein purification system, flow cytometry analyzer, physiological biochemical analysis system, barrier level Animal Laboratory, Space Biological Tank Ground Demonstration and Verification System, Ultrasound Imaging Equipment, 128-lead Brain-Energy Detection Equipment, Optoelectronic Synchronization Brain Function Detection Equipment, Eye Tracker, Multi-GPU High Performance Computing Platform, etc.

Based on our university's background of engineering, the biomedical engineering discipline includes six distinctive research directions:

1. Space Biology and Medical Engineering:

Research on major national needs such as manned space flight and deep space exploration, and this direction belongs to the special discipline of national defense. The research on the key technologies of the space bio-compartment, the space life sciences load technology, the molecular mechanism of the space environment biomedical effects, the astronaut health monitoring and protection technology, and the celestial biology are characteristic and advanced.

2. Autonomous micro-biological medical system (integrated medical engineering):

Supported by major projects such as "Cerebral Vascular Surgery Assist System Technology", the autonomous micro-biological medical system has been developed. The academic echelon has been engaged in research on biomedical micro-system for many years and has achieved rich results.

3. Digital Health and Smart Medical:

Focus on advanced sensor technology, identification technology, mobile health equipment, advanced medical imaging systems, precision medical technology, the special studies include modern medical signal processing, functional imaging and molecular imaging, patient-centered mobile health information technology, and bioinformatics.

4. Medical biotechnology:

Focusing on new strategies, new methods, and new technologies for the diagnosis and treatment of major diseases, we mainly work on new technologies and methods for tumor-targeted diagnosis and treatment, neural circuit control, novel pathogen microbial classification, and innovative drug development. The distinctive research includes the construction of biological expression systems, the creation of new drugs for plant drugs (Dai drug), drug equivalence assessment techniques, new approaches to tumor immunotherapy, and the etiology of Alzheimer's disease.

5. Biomedical Detection Technology:

Based on the study of the etiology of major diseases, new clinical testing indicators and new detection technologies are developed. At the same time, for the country's needs, biological rapid inspection techniques for diseases and foods, especially microfluidic chip detection technologies, have been developed.

#### 6. Bio-Aware Computing and Rehabilitation Engineering:

The main research includes computational theory and neural model of visual and auditory perception, non-invasive measurement techniques, formal expression of biological perception, interpersonal (human-computer) multi-channel information interaction technology and its application in rehabilitation engineering.

## 2. Training Target

This program is designed to cultivate students with good moral, intellectual, physical and good scientific quality who is very competitive in the emerging discipline of biomedical engineering-related, interdisciplinary, new technological field. They will to be high-level and applicable specialized persons with innovative spirit and practical ability in biomedical engineering basic research or high-tech research and development field. The requirements are:

1. Master the solid theoretical foundation and systematic professional knowledge of the biomedical engineering specialty, understand the frontier trends of this specialty. Master the experimental skills, testing methods and evaluation techniques in biomedical engineering and possess the ability of engaging in research, teaching and solving local problems in engineering. Possess the engineering consciousness, strong awareness of management and development and management and development.
2. Master a foreign language, can skillfully read professional foreign language materials and write papers. Proficiency in computer application technology.
3. Actively participate in physical exercise, maintain a good physical and mental health quality.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1701002	Matrix analysis; 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master≥2 Ph.D.≥2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
	1701007	modern regression techniques in data sciences 现代回归方法	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	1600026	Bioinstrument analysis technology 生物仪器分析技术	32	2	1	Compulsory	Master/Ph.D.	Master≥2 Ph.D.≥2
Major Optional Course	1600059	Advanced Biochemistry and Molecular Biology Experiments 高级生物化学与分子生物学实验	32	2	2	Optional	Master/Ph.D.	Master≥6 Ph.D.≥2
	1600005	Advanced pharmacology 高级药理学	32	2	1	Optional	Master/Ph.D.	
	1600023	Frontiers in Biomedical Engineering 生物医学工程前沿	32	2	1	Optional	Master/Ph.D.	
	1600018	Biomechanics and Simulation 生物力学与仿真	32	2	1	Optional	Master/Ph.D.	
	1600006	Space Medicine and Cosmobiology	32	2	1	Optional	Master/Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course		航天医学与宇宙生物学						Master≥6 Ph.D.≥2
	1601008	Human anatomy and physiology 人体解剖生理学	32	2	1	Optional	Master /Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3. Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4. Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

**6. The Dissertation Related Work**



### 1. Literature Review & Opening Report

Under the guidance of the supervisor, International Graduate Students should pick a research direction as well as reading certain amount reference books, both Chinese or foreign languages, at the same time.

Master students should write a literature review, no less than 4000 words, based on the reading of over 30 papers, both Chinese or foreign languages, of their own research field.

Ph.D. students should write a literature review, no less than 5000 words, based on the reading of over 50 papers, both Chinese or foreign languages, of their own research field.

On the basis of the Literature Review, the Opening Report should mainly introduce following factors: research target, research meaning, methods of research, technical route, implementary plan, arrangements and expected results.

### 2. Mid-Term Evaluation

Schools organize Mid-Term Evaluation for International Students, which includes the evaluations of course study, literature review, opening report and the research progress of publishing papers and writing of Degree thesis.

### 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students)

International Graduate Students should complete a Degree thesis under the guidance of supervisors. Ph.D. students can take the Thesis Pre-Defense after finishing a supervisor-approved first draft.

### 4. Thesis Defense

After thesis approved and the Sub- Committee of Degree Assessment authorized, International Graduate Students can take the Thesis-Defense.

### 5. Degree Conferment

International students should acquire certain academic results as regulated when applying for a Master or Ph.D. Degree. Each program should clarify the categories of Master Degree and Ph.D. Degree.

The discipline awards Master of Engineering (M.E) degree and Doctor of Engineering (D.E) degree to qualified applicants respectively.

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on*

**Time Nodes of Relevant Procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense	

**7. Course Syllabus**

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Statistics

## 统计学

(071400)

### 1. Overview of the Program (学科简介与研究方向)

Beijing Institute of Technology (BIT) established the second-level master program in Probability Theory and Mathematical Statistics in 1984. It started to enroll undergraduate students in statistics as well as Ph.D. students in statistics (under the Applied Math Ph.D. program) in 2003 and then further established the professional master program in 2010. In 2011, BIT was among the first batch of universities that can grant the first-level doctorate degrees in statistics, forming a comprehensive talent education system consisting of both the undergraduate and (academic and professional) graduate programs. Notable alumni include Professor Bing Li from the Penn State University who is an elected fellow of the Institute of Mathematical Statistics (IMS) and Professor Kehai Yuan from the University of Notre Dame who is a famous expert in psychological statistics. Currently, there are 41 faculty members with diverse backgrounds and rich overseas academic experience. There are four disciplines: Mathematical Statistics, Experimental Design and Reliability Optimization, Statistical Analysis of Big Data, and Applied Probability Theory.

### 2. Training Target (培养目标)

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

Master students should master the solid basic theory and systematic knowledge of the discipline, and have the ability to engage in scientific research work or specialized technical works independently.

Doctoral students should master the solid basic theory and systematic knowledge of the discipline, and have the ability to work independently in scientific research, and make creative achievements in science and technology.

### 3. Length of Schooling (学制)

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for

master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
	1701007	Modern Regression Techniques in Data Sciences 现代回归方法	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	1700106	高等概率论 Advanced Probability Theory	48	3	1	Compulsory	Master/Ph.D.	Master $\geq$ 9 Ph.D. $\geq$ 6
	1700116	高等数理统计 Advanced Mathematical Statistics	48	3	1	Compulsory		
	1700127	泛函分析（模块 1） Functional Analysis (Module 1)	64	4	1/2	Compulsory		
	1700154	统计推断 Statistical Inference	48	3		Compulsory		
	1700150	统计机器学习 Statistical Machine	48	3	1/2	Optional		

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
		Learning						
	1700121	现代试验设计 The Design of Modern Experiments	48	3	1/2	Optional		
	1700133	随机微分方程 Stochastic Differential Equation	48	3	1/2	Optional		
	1700136	多元统计分析 Multivariate Statistical Analysis	48	3	1/2	Optional		
Major Optional Course	1700142	时间序列与预测模型 Time Series and Predictive Models	32	2	1/2	Optional	Master /Ph.D.	Master≥8 Ph.D.≥3
	1700140	数据挖掘 Data Mining	48	3	1/2	Optional		
	1700110	随机过程 Stochastic Process	48	3	1/2	Optional		
	1701146	(英) 现代优化方法 Modern Optimization Methods	48	3	1/2	Optional		
	1700160	计算机试验设计方法与建模 The Design and Analysis of Computer Experiments	48	3		Optional		
	1700161	统计前沿选讲 Lecture on modern statistical models	32	2		Optional		
	1700162	生物信息与统计 Bioinformatics and Biostatistics	48	3		Optional		
	1700163	非参数统计 Nonparametric Statistics	48	3		Optional		
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1).Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2) Basic Course

If the mathematics courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3) Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4) Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1) Academic Activity (1 credits)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2) Innovative Practice (1 credits)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

**6. The Dissertation Related Work**

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferment of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	---	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	---	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

**7. Course Syllabus**

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Mechanics

## 力学

(080100)

### 1. Overview of the Program

Mechanics is both a fundamental discipline and a technical discipline. It is a bridge between science and engineering. Mechanics concerns with the motions of physical objects, specifically the relations among force, matter, and motion. Mechanical bodies stand for a wide assortment of objects, including particles, rigid bodies, solids, fluids, etc. Depending on the nature of the bodies, mechanics can be divided into three branches: (a) general mechanics, dealing with the mechanical behavior of material points and rigid bodies; (b) fluid mechanics (or the mechanics of continuous media), which is concerned with ideal and viscous fluids; and (c) mechanics of deformable media, which studies the deformation of solid bodies under applied external forces.

The full-time graduate program of mechanics will provide the students with opportunities for further development in the principles of mechanics and their applications to engineering, aiming at cultivating the high-level professionals with solid theoretical and practical background in mechanics. This program involves both fundamental courses and research project. Courses will focus on the fundamentals of mechanics, including solid mechanics, fluid mechanics, structural dynamics, computational mechanics, etc. The project will investigate challenging and fundamental problems in mechanics and engineering under the guidance of a supervisor.

### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

The students should have a solid foundation of the basic theory and professional knowledge in the field of mechanics, have the capability of organization and administration of scientific research and engineering, have good spirit of cooperation and strong communication skills, have good command of listening and speaking in English, be good at reading professional literature and writing English thesis of related field. The Master Candidates will be developing in every way morally, intellectually and physically and will be competent for teaching and scientific research in mechanics and related field. The doctor degree candidates will be competent for teaching, scientific researching, developing and project administrating in colleges, universities and high-



tech enterprises.

### 3. Length of Schooling

The basic length of schooling for a master student is 2 years. In principle, a master student should complete all the courses in the first academic year. The thesis work time should not be less than one year. The maximum length of study for a master student is extended by 0.5 years on the basis of 2 years. The basic length of schooling for a Ph.D. student is 4 years. In principle, a Ph.D. student should complete the courses in the first academic year. The thesis work time should not be less than three years. The maximum length of study for a Ph.D. student is extended by 2 years on the basis of 4 years.

### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory /Optional	Master /Ph.D.	Credits Requirement
Public Courses	3700005	Chinese Language I 基础汉语I	96	6	1	Compulsory	Master /Ph.D.	Master = 14 Ph.D. = 14
	3700006	Chinese Language II 基础汉语II	96	6	2	Compulsory	Master /Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master /Ph.D.	
Basic Courses	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master /Ph.D.	Master $\geq 2$ Ph.D. $\geq 2$
	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master /Ph.D.	
Discipline Core Courses	0201010	Continuum Mechanics 连续介质力学	32	2	1	Optional	Master /Ph.D.	Master $\geq 2$ Ph.D. $\geq 2$
	0101015	Fluid Mechanics 流体力学	48	3	1	Optional	Master /Ph.D.	
	0101023	Fundamentals of Structural Dynamics 结构动力学基础	32	2	1	Optional	Master /Ph.D.	
Major Optional Courses	0201021	Computational Mechanics 计算力学	32	2	2	Optional	Master /Ph.D.	Master $\geq 6$ Ph.D. $\geq 4$

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory /Optional	Master /Ph.D.	Credits Requirement
Major Optional Courses	0101020	Introduction to Computational Fluid Dynamics 计算流体力学导论	32	2	2	Optional	Master /Ph.D.	Master $\geq 6$ Ph.D. $\geq 4$
	3201005	Multibody Dynamics 多体动力学	48	3	1	Optional	Master /Ph.D.	
	0101022	Smart Materials and Structures 智能材料与结构	32	2	1	Optional	Master /Ph.D.	
	0101021	Measurement for Micro- and Nano-Technology 微纳尺度测量技术	32	2	2	Optional	Master /Ph.D.	
	0201015	Structural Response to Blast Loading 结构冲击动力学响应	32	2	2	Optional	Master /Ph.D.	
	0201022	Dynamic Behaviors of Materials 材料动态力学行为	32	2	2	Optional	Master /Ph.D.	
	0201020	Dynamic Test Techniques 动态测试技术	32	2	2	Optional	Master /Ph.D.	
	0301011	Principle of Finite Element Method 有限元原理	32	2	2	Optional	Master /Ph.D.	
	0301008	Elasticity 弹性力学	32	2	1	Optional	Master /Ph.D.	
	0101006	Orbital Mechanics 轨道力学	48	3	1	Optional	Master /Ph.D.	
	0301004	Advanced Engineering Thermodynamics and Heat Transfer 高等工程热力学和传热学	48	3	2	Optional	Master /Ph.D.	
	1600018	Biomechanics and Simulation 生物力学与仿真	32	2	1	Optional	Master /Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory /Optional	Master /Ph.D.	Credits Requirement
Total Credits	Master $\geq 24$ credits				Ph.D. $\geq 22$ credits			

**Notes:**

## 1. Public Courses

- (1) Chines Language: Set by International Students Center of BIT. All international students must take this required course.
- (2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2. Basic Courses

If the mathematic courses listed in the chart can't meet the requirement, different programs can set their own basic courses.

## 3. Major Courses

## (1) Discipline Core Courses

Different Programs can set their own Discipline Core Courses.

## (2) Major Optional Courses

International students should choose courses from their own or other programs. Under the guidance of the supervisor, the international master students can take undergraduate courses if needed. The international Ph.D. students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

### 1. Literature Review & Opening Report

Under the guidance of the supervisor, an International Graduate Student should pick a research direction as well as reading certain amount reference books, both Chinese or foreign languages, at the same time.

A master student should write a literature review, no less than 4000 words, based on the reading of over 30 papers, both Chinese and foreign languages, of his/her own research field.

A Ph.D. student should write a literature review, no less than 5000 words, based on the reading of over 50 papers, both Chinese or foreign languages, of his/her own research field.

On the basis of the Literature Review, the Opening Report should mainly introduce the following factors: research target, research meaning, and method of research, technical route, implementary plan, arrangements and expected results.

### 2. Mid-Term Evaluation (for Ph.D. students)

Schools organize Mid-Term Evaluation for International Students, which includes the evaluations of course study, literature review, opening report and the research progress of publishing papers and writing of Degree thesis.

### 3. Thesis Writing and Thesis Pre-Defense (for Ph.D. students)

An International Graduate Students should complete a Degree thesis under the guidance of supervisor. A Ph.D. student can take the Thesis Pre-Defense after finishing a supervisor-approved first draft.

### 4. Thesis Defense

After thesis approved and the Sub-Committee of Degree Assessment authorized, International Graduate Students can take the Thesis-Defense.

### 5. Degree Conferment

International students should acquire certain academic results as regulated when applying for a Master or Ph.D. degree. Each program should clarify the categories of Master Degree and Ph.D. Degree.

More details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*.

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review & Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	— —	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	— —	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

**7. Course Syllabus**

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Mechanical Engineering

## 机械工程

(080200)

### 1. Overview of the Program

This program is the broad mechanical engineering field to develop and construct. It solves the science and technical problems of design, performance achievement and optimization of mechanical product using the basic theory of mechanical engineering and studies the theory and technology of mechanical products as well as traditional vehicle, unmanned vehicle, intelligent connected vehicle, new energy vehicle, bionics and robot and also studies the theory and technologies includes intelligent manufacturing, sensing and mechatronic control, opto-electronics micro-nanofabrication science and engineering.

This program is a full-time degree, including both coursework and project. It aims at cultivating the high-level specialized personnel with a firm grasp of basic theories and professional knowledge of mechanical engineering, having the ability to solve practical problems and undertake the tasks for professional technology or management. They will participate in projects in mechanical engineering under the guidance of their advisors and complete their graduation thesis based on the projects they have conducted.

Dedicated to the development of general mechanics, mechanical engineering program contains the first-class disciplines – mechanical engineering. The mechanical engineering discipline in Beijing Institute of Technology was founded in 1943 in Yan'an Academy of Natural Science and began to enroll graduate students in 1955. In 1981, the second-class discipline named Vehicle Engineering was authorized to offer the doctorate degree. Mechanical engineering was selected as one of the earliest disciplines that offers first-class discipline doctorate degree in 1998. Mechanical engineering discipline was selected as one of the earliest national first-level key disciplines in 2007, and also ranked as “mechanical engineering” discipline category A in 2017.

As the discipline that cultivated the first tank in China, mechanical engineering serves as an important research and teaching base for armored vehicle design. Based on the great needs of national security, mechanical engineering has developed the transmission design theory for armored vehicles and cultivated the top-rated armored vehicle in the world. Aiming at the development of national key emerging industries, electric commercial vehicle design platform was generated. The platform cooperated with 15 new-energy vehicle industry members and the outcome has been successfully applied on the electric vehicles used in the transportation systems in APEC. It's worth noted that through years of explorations and innovations, the electric

commercial vehicle technology was successfully exported to European Union. As one of the most important national platform, the “electric vehicle big data collaboration platform” was built to monitor electric vehicle, and provides EV design requirements for domestic vehicle industry. Mechanical engineering is actively engaged in the “Made in China 2025” strategy, a novel micro-nano machining technology based on dynamic control of instantaneous electron was proposed to reduce the height of recast layer by 60%. The machining efficiency was improved 50 times and depth-diameter ration/depth-width ratio limit was increased by 30 times. This technology was selected as one of the sixteen national science and technology major projects for the machining of micro holes on the target sphere. Mechanical engineering also conducts systematic and cooperative research in unmanned vehicle, humanoid robot and other innovative technologies.

There are now 53 professors and 57 doctoral supervisors in mechanical engineering discipline. Among them, one professor is academican of Chinese Academy of Engineering (CAE) and one is foreign academican of Chinese Academy of Sciences (CAS), 37 faculties entered national high-level talent plans such as Changjiang Distinguished Professor, distinguished young scholars, 511 Talents of National Defense and National Recruitment Program. The discipline has seven innovation teams sponsored by Ministry of Education, Ministry of Industry and Information Technology and Ministry of Science and Technology, four national research platforms including 2011 cooperative innovation center, eight provincial research centers and two centers was selected as Overseas Expertise Introduction Center for Discipline Innovation (111 Center). The area of the laboratories is over 26 thousand square meters, and the total assets of facilities reach RMB 400 million.

The main research directions in Mechanical Engineering of BIT include:

(1)Vehicle Theory and Unmanned Vehicle Technology. Focusing on the theory and integration of vehicle system, vehicle dynamics, simulation, NVH, vehicle reliability, vehicle new driveline theory and technology; system technology, perception, path planning, control, testing and evaluation of unmanned vehicles; multi-ground platforms cooperation technology, ground-aerial unmanned system cooperation technology. It has reached international advanced level in domains such as integrated transmission of vehicles, hydraulic transmission, high-power hydraulic components, electro-mechanical transmission, and system technology of unmanned platforms.

(2)Intelligent Connected Vehicles and Electric Drive.Focusing on intelligent connected vehicles system theory, big data analysis and deep mining of vehicle, deep environment perception and multi-source information fusion, intelligent autonomous decision and dynamics control, intelligent connected vehicle architecture and information security, electric vehicle design theory &system integration and control, vehicle lightweight design

method and material application, on-board energy source security and efficiency, high-efficiency and high-energy density integrated electric drive system. It is at the forefront of the world in big data analysis and mining technology of vehicle and pure electric commercial vehicle platform technology and pure electric bus application technology.

(3) Intelligent Manufacturing Engineering. Based on the “Made in China 2025” Strategic Plan, taking the major needs of the defense technology field as the background, taking the intelligent technology of all stages in the production and manufacturing as the core and training the innovative talents in the intelligent manufacturing field as its goal. The advanced processing national defense key laboratory focuses on the research of difficult-to-machine materials, high-efficiency and precision ultra-precision machining theory and tooling technology, digital design and manufacturing technology, non-destructive testing technology, intelligent assembly technology, additive manufacturing technology and intelligent production and manufacturing service technology. It has obvious features and advantages in the processing technology of difficult-to-machine materials, product manufacturing quality inspection and control and digital design and manufacturing technologies.

(4) Intelligent Robots and Systems. Focusing on the study of theoretical methods and techniques including motion bionics, multi-scale sensing and manipulation, biomechanical integration and interaction and system control and integration. It has obvious advantages and features in the research of humanoid robots and has reached the international advanced level. It is at the leading international level in the coordination and control of martial arts and other complex actions.

(5) Electromechanical Systems and Sensors. Focusing on sensing, measurement and control technology, micro-mini unmanned system design and integration, advanced control and drive technology, information and integrated electronic control technology and non-destructive testing theory and technology. It has obvious advantages and features in the intelligent control and ultrasonic detection of unmanned systems.

(6) Opto-Electronics Micro-Nano Fabrication Science and Engineering. Facing the frontier basic science and common technology problems in micro-nano fabrication, highlighting the unique advantages of multi-disciplinary integration of photo-machine-electricity; focusing on micro/nano design theory and methods, micro-nano mechanical watch/interface behavior and control, laser micro-nano fabrication, micro-structured composite processing technology and precision mechanical system assembly theory and technology. It has distinctive features in the micro-nano system design, laser micro-nanometer manufacturing, precision/micro-structure composite processing and assembly technology, in which the femtosecond laser micro-nano processing mechanism and method living in the international advanced level.



## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

### (1) Master student

Master students trained in this subject should have good research ethics and professionalism. They should master the solid basic theory and systematic expertise of the discipline, master the modern experimental methods and the skills of the discipline, and have the ability to engage in scientific research or undertake specialized technologies independently. They should be capable of performing scientific research, engineering design, product development and teaching in research institutes, companies, and universities.

### (2) Ph.D. student

The Ph.D. students cultivated in this subject should have the scientific spirit and the international perspective. They should master a solid and broad basic theory and systematic in-depth expertise of the discipline; master the modern experimental methods and skills of the discipline. They have a certain degree of International academic communication skills; be capable of conducting scientific research independently. They also need to have a good spirit of cooperation, and be able to make creative achievements in scientific research or technical expertise. Ph.D. students should also master solid and basic theory, systematic specialized knowledge in the field of mechanical engineering, modern experimental methods and skills, international academic exchange ability, the capability of being engaged in scientific research independently, good cooperation spirit and be able to make creative achievements in scientific research or expertise.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years.

The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum And Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	0301001	Introduction to Advanced Engineering Mathematics 高等工程数学导论	48	3	2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1700002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	0301002	Fundamentals of Modern Control Theory 现代控制理论基础	48	3	2	Optional	Master	Master $\geq$ 8 Ph.D. $\geq$ 4  Among the Credits of Discipline, Core Course: Master $\geq$ 2 Ph.D. $\geq$ 2
	0301003	Advanced Mechanical Vibration 高等机械振动	48	3	1	Optional	Master	
	0301004	Advanced	48	3	2	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Discipline Core Course		Engineering Thermo-Dynamics and Heat Transfer 高等工程热力学和传热学						Master $\geq 8$ Ph.D. $\geq 4$  Among the Credits of Discipline, Core Course: Master $\geq 2$ Ph.D. $\geq 2$
	0301005	Computational Fluid Dynamics 计算流体力学	32	2	2	Optional	Ph.D.	
	0301006	Advanced Control Engineering 先进控制工程	32	2	1	Optional	Ph.D.	
	0301007	Fatigue Life Design of Mechanical Structure 机械结构疲劳与寿命设计	32	2	1	Optional	Ph.D.	
	0301016	Energy-saving and New Energy Vehicle Technology 节能和新能源汽车技术	32	2	2	Optional	Master	
	0301017	Learning-based Intelligent	48	3	2	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
		Vehicle Technology 智能车辆 机器学习技术						
Major Optional Course	0301008	Elasticity 弹性力学	32	2	1	Optional	Master	Master $\geq 8$ Ph.D. $\geq 4$
	0301009	Structural Optimization Method 结构优化方法	32	2	1	Optional	Master	Among the Credits of Discipline, Core Course: Master $\geq 2$ Ph.D. $\geq 2$
	0301010	Modern Measurement Technology 现代测试技术	32	2	2	Optional	Master	
	0301011	Principle of Finite Element Method 有限元原理	32	2	2	Optional	Master	
	0301012	Principle and Application of CAD/CAM/CAE CAD/CAM/CAE原理及工程应用	32	2	1	Optional	Master	
	0301013	Engineering Management 工程管理	32	2	2	Optional	Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/ Optional	Master /Ph.D.	Credits Requirement
Major Optional Course	0301014	Cutting Theory and Advanced Machining Processes 切削理论与先进制造基础	32	2	1	Optional	Ph.D.	Master≥8 Ph.D.≥4  Among the Credits of Discipline, Core Course: Master≥2 Ph.D.≥2
	0301015	Advanced Technology of Modern Vehicle 现代车辆先进技术	32	2	2	Optional	Ph.D.	
	0301018	Laser Micro/Nano Fabrication and High-resolution Characterization 激光微纳制造及高分辨表征	32	2	2	Optional	Master	
	0301019	Model Predictive Control and Applications 模型预测控制	32	2	1	Optional	Master	
Total Credits	Master≥24 credits                      Ph.D.≥20 credits							

**Notes:**

## 1) Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this

compulsory course.

## 2) Major Optional Course

International students should choose courses from their own program or from other programs under the guidance of the supervisor. Master candidates can take undergraduate core courses if needed. The credits for undergraduate courses are not included in the credits required by the master program. Master candidates can also take Ph.D. courses if needed, and the Ph.D. course credits can be included into the credits required. Ph.D. candidates can take master courses if needed. The credits for master courses are not included in the credits required by the Ph.D. program.

## 5. Practice Part

### (1) Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

### (2) Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

(1) Literature Review & Opening Report; (2) Mid-Term Evaluation; (3) Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); (4) Thesis Defense; (5) Degree Conferment.

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time Nodes of Relevant Procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review & Opening Report	Before Week 1 of the 3 <sup>rd</sup> semester	Before Week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before Week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before Review
Thesis Defense	At least 9 months after the Opening	At least 18 months after the

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
	Report	Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense	

## **7. Course Syllabus**

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Optical Engineering

## 光学工程

(080300)

### 1. Overview of the Program

The Optical Engineering at BIT was established in 1953. Recruitment of graduate students began in 1954, and this discipline was the first in the field of optical engineering in China. In 1983, the MOE authorized the granting of doctoral degrees for military optics and optical instruments. In 1985, optical instrument was further enhanced with the establishment of one of the first postdoctoral research stations in the nation. In 1987, military optics was recognized by the Chinese government as a national key discipline (the only one in the field), and optical instruments was recognized as a ministry-level key discipline. In 1997, military optics and optical instruments were merged to Optical Engineering, which has remained a top national key discipline in numerous discipline evaluations by the government over the years. In 2017, Optical Engineering was selected into the Double First-Class University Plan as the first-class discipline to receive national priority support.

The main research directions include:

- (1) Broad-band Photoelectronic Imaging and Perception
- (2) Mixed Reality and Advanced Display
- (3) Optical Design, Manufacture and Testing
- (4) Laser and Optoelectronics Technology
- (5) Micro-nano Optics and Photonics
- (6) Information Optics and Color Engineering

### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students



is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
	1701007	modern regression techniques in data sciences 现代回归方法	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	0401001	Introduction to Quantum Optics 量子光学导论	32	2	2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	0401002	Modern Color Science and Application 现代颜色技术原理 及应用	32	2	1	Optional		
Major Optional Course	0401003	Artificial Intelligence and Biometrics 人工智能与生物特 征识别	32	2	2	Optional	Master/Ph.D.	Master $\geq$ 6 Ph.D. $\geq$ 2
	0401004	Biomedical Optoelectronics 生物学中的光电 子学	32	2	2	Optional		
	0401005	Introduction to Fabrication of Micro-nano	32	2	2	Optional		

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course		Optoelectronic Device/System 微纳光电子器件/系统制造导论						Master≥6 Ph.D.≥2
	0401006	Digital Image Processing 数字图像处理	32	2	2	Optional		
	0401007	Introduction to Computational Optics 计算光学导论	32	2	1	Optional		
	0401008	Computational Optical Sensing and Imaging Theory 计算光学传感与成像理论	32	2	2	Optional		
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training

period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time Nodes of Relevant Procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Instrument Science and Technology

## 仪器科学与技术

(080400)

### 1. Overview of the Program

The representative research areas include instrument design and system integration, intelligent sensing and new imaging, precision photoelectric test technology and instruments, and optical scene simulation and system evaluation, which are described in detail as follows:

#### (1) Instrument design and system integration

The topic mainly engaged in instrument engineering design methods, instrument precision, optimization and reliability design, integrated design and system integration methods for large and complex precision instruments, ergonomics and computer-aided design techniques, intelligent instruments and virtual instruments, manufacturing and testing of MEMS and devices, micro-robots and their payload technology, biomedical information detection and sensor bionic technologies, and others.

#### (2) Intelligent sensing and new imaging

The topic mainly focuses on intelligent digital interferometers, optical aspherical and freeform surface detection technology, micro-nano optical element design and detection technology, intelligent photoelectric imaging sensors, advanced active photoelectric detection and imaging, bionic visual imaging and identification, computational imaging and scattering media imaging, multi-spectral and multi-format imaging technology, remote sensing imaging technology, and others.

#### (3) Precision photoelectric test technology and instruments

The topic mainly focuses on the research of optical testing and metering, confocal interference measurement, optical microscopy imaging, spectromicroscopic imaging, precision photoelectric sensing technology and systems, nanometer measurement and control technology and systems, precision optoelectronic test equipment and equipment integration, Instrumental accuracy theory, and others.

#### (4) Optical scene simulation and system evaluation

The topic mainly focuses on optical target characteristics, atmospheric transmission characteristics, similarity theory and technology, computer image generation technology, optical scene modeling technology, new laser

devices and technologies and the study of design and evaluation on complex optical systems, new radiation sources technical and evaluation, scene simulation system design and evaluation, and others.

## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

## 4. Curriculum and Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=12 Ph.D.=12
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	Master=2 Ph.D.=2
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master≥2 Ph.D.≥2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
	1701007	modern regression techniques in data sciences 现代回归方法	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	0401010	Deep Learning and Intelligent Image Analysis 深度学习与智能图像分析	32	2	2	Compulsory	Master/Ph.D.	Master≥2 Ph.D.≥2

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course	0401001	Introductions to Quantum Optics 量子光学导论	32	2	2	Optional	Master /Ph.D.	Master≥6 Ph.D.≥2
	0401009	Laser Technology and its Applications in Advanced Instruments 激光技术及其在先进仪器中的应用	32	2	1	Optional		
	0401002	Modern Color Science and Application 现代颜色技术原理及应用	32	2	1	Optional		
	0401011	Optical Interferometric Measurement 光学干涉测量	32	2	1	Optional		
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time Nodes of Relevant Procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Materials Science and Engineering

## 材料科学与工程

(080500)

### 1. Overview of the Program

This university major of material science and engineering was founded in 1952, offering bachelor's degree. From 1955, this major started to offer the master's degree. It was authorized to offer the Doctor's degree in 1981 and was granted the permission to recruit post-doctors from 1985. Material Science and Engineering was listed as a key academic major of Ministry of Machinery and Electronics Industry in 1988, Ministry of Weaponry Industry Department in 1991, and National Defense Science and Technology Committee in 2001. It is one of national "211 Project", national "985 Project key academic majors, being incorporated into "Advanced Material Science and Technology Innovation Platform" in the second stage of "985". In 2005, the Materials Science and Engineering became a Level-I discipline. After more than 50 years of construction, this academic major has built a research platform, which can support various research fields of material science and engineering and combine materials design, fabrication, analysis, characterization, and performance assessment. The total assets of the equipment amounted to over 90 million yuan. This major has the abilities of solving the critical problems of material science and engineering in the construction of national economy, and has been leading a large number of national key projects, making tremendous achievements in a large number of applications of materials science and engineering.

In the past five years, as the leading unit, this discipline has won more than 20 national and provincial awards, including three National Technological Invention Second Prize, one Special Prize of National Defense Science and Technology Progress Award, one National Teaching Achievement Award. This discipline possesses many distinguished teachers, including one Academician of Chinese Academy of Science, two Member of the Chinese Academy of Engineering, two chair professors of 973, one "Cheung Kong Scholar", of ministry of education, two winner of National Outstanding Youth Fund, one expert of National Experts with Outstanding Contributions, four winners of He-Liang-He-Li Award, seven professors in Thousand Youth Talents Plan, twelve professors in China Youth Science Fund Project and Trans-Century Training Program Foundation for the Talents By the State Education Commission. This discipline has constructed various national and provincial supporting platforms, including National Science Key Lab of Impact Environment on Materials, National Flame-retardant



Materials Engineering and Research Center, National Flame-retardant Materials Engineering and Research Center, National Flame-retardant Materials Engineering and Research Center, National High Technology Development Center Green Materials, National Engineering Research Center of Flame Retardant Materials, Collaborative Innovation Center of Electric Vehicles in Beijing, Beijing Higher Institution Engineering Research Center of Power Battery and Chemical Energy Materials, Beijing Key Laboratory of Construction Tailorable Advanced Functional Materials and Green Applications, Beijing key laboratory of environmental science and engineering, Beijing engineering research center of cellulose and its derivatives, Engineering Research Center of Fire-Safe Materials and Technology(Beijing Institute of Technology), Ministry of Education.

In 2018, the discipline of material science and engineering of Beijing Institute of Technology ranked in 50-100 in the world from QS World University Rankings, top 6 throughout the country, and No.136 in the world of ESI international ranking. The main research directions including:

- (1) Mutilate and protective material: The main research objects are the warhead material and armor protection material.
- (2) Advanced materials molding theory and technology: Including the theory and technology of liquid molding of special materials, the basic theory and engineering application research of the new technology of plastic processing of warhead materials, research of powder metallurgy technology, research of the numerical modeling and simulation technology of material forming process.
- (3) Low dimensional materials physics and chemistry: mainly including the preparation of zero-dimensional, one-dimensional and two-dimensional nanomaterials, the study of materials performance, especially semiconductor nanomaterials.
- (4) Functional polymer and flame retardant materials: Focusing on biomedical materials, Photoelectric functional polymer materials and flame-resistant materials.
- (5) Materials surface engineering: Including the design and optimization of surface special functional coating materials, the numerical simulation of thermal spraying process, the preparation of coating materials, the performance testing and characterization of materials, the processing of surface special functional coating materials.
- (6) Energetic material: Including the molecular design, synthesis and preparation of high energy density

compound, energetic polymer, nanometer energetic materials, functional energetic auxiliaries, high performance solid propellant and charging technology, the progress and application of solid propellant forming, cladding layer and thermal barrier material technology, high-energy explosive mixture and charging technology.

(7) Energy and environmental materials: Studying various key materials and its engineering application technologies of new chemical energy sources and physical energy sources. The synthesis characterization, molecular design, simulation, performance prediction and economic evaluation of various new green energy materials. New theory, new method and new technology in preparation and application of various new green energy materials. New theories, new methods and new technologies in the preparation and application of energy materials, The failure mechanism of environmental materials and resource recovery and recycling technology of various waste. The theory problems in the treatment process of waste water, waste gas and solid waste. The basic theories, systematic scientific methods and practical applications of environmental planning and management.

## 2. Training Target

To cultivate innovative talents who insist on the Party's basic route, with national sense of mission and social responsibility, law-abiding, well-behaved, honest and trustworthy, physical and mental health, full of scientific spirit and international vision of high-quality and high-level.

Master students should master the solid basic theory and systematic expertise of the discipline, and have the ability to work in scientific research independently and make creative achievements in scientific or technical expertise.

Ph. D. students should have a solid and broad basic theory of the subject and systematic and in-depth expertise, have the ability to work independently in scientific research, and make creative achievements in scientific or technical expertise.

## 3. Length of Schooling

Subjects	Academic Masters	Academic Doctors
Engineering	2 years	4 years
Note: 1. The maximum length of schooling for academic masters is extended by 0.5 years on the basis of the basic length of schooling.		

2.The maximum length of schooling for Ph. D. students is extended by 2 years on the basis of the basic length of schooling.

3. Academic Doctor who is especially outstanding and completed his dissertation in advance can graduate 1 year ahead of schedule.

#### 4. Curriculum and Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory / Optional	Master /Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master /Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master /Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master /Ph.D.	
Basic Course	1700001	Numerical analysis 数值分析	32	2	1/2	Optional	Master	Master≥2 Ph.D.≥2
	1701003	Science and engineering calculation 科学与工程计算	48	3	1/2	Optional	Ph.D.	
	1701007	modern regression techniques in data sciences 现代回归方法	32	2	1/2	Optional	Master /Ph.D.	
Discipline Core Course	0901001	Solid state chemistry 固体化学	32	2	1	Optional	Master /Ph.D.	Master≥2 Ph.D.≥2
	0901002	Theory of Materials Processing 材料加工理论	32	2	2	Optional	Master /Ph.D.	
Major Optional Course	0901004	Novel Energetic Materials 新型含能材料	32	2	1	Optional	Master /Ph.D.	Master≥6
	0901005	Nanomaterials and Physics 纳米材料与物理	32	2	1	Optional	Master /Ph.D.	
	0901006	Optoelectronic Materials and Devices 光电材料与器件	32	2	2	Optional	Master /Ph.D.	
	0901007	Characterization Technique in	32	2	2	Optional	Master /Ph.D.	Master≥6

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory / Optional	Master /Ph.D.	Credits Requirement
Major Optional Course		Electrochemical Measurement and Analysis of Materials 材料电化学测试与分析表征技术						
	0901008	Microstructural Analysis and Properties Characterization of materials 材料微结构分析与性能表征	32	2	2	Optional	Ph.D.	Ph.D.≥2
	0901010	High-energy Beam Processing Technology 高能束流加工与技术	32	2	1	Optional	Ph.D.	
	0901011	Electrochemical Fundamentals and Application of Materials 材料电化学理论与应用	32	2	1	Optional	Ph.D.	
	0901012	Advanced Carbon Materials (英) 先进碳材料	32	2	2	Optional	Master /Ph.D.	
	0901013	Materials Engineering and Performance 材料工程与力学性能	32	2	2	Optional	Master /Ph.D.	
Total Credits	Master≥24credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different programs can set their own Basic Course.

## 3. Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4. Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

# 5. Practice Part

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, is highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

# 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time Nodes of Relevant Procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester

Mid-Term Evaluation	———	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	———	Before review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Degree Application	The application should be raised in a certain time after the Thesis Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference and Lecturer Introduction.

# Power Engineering and Engineering Thermophysics

## 动力工程及工程热物理

(080700)

### 1. Overview of the Program

The Program of Power Engineering and Engineering Thermophysics in Beijing Institute of Technology (BIT) was founded based on Internal Combustion Engine Major in 1952. It is mainly engaged in talent cultivation and scientific research on vehicle power system. In 1981, this program was granted Military Vehicle Engineering (including engines) Major's master and doctoral degrees in the first batch. In 1993, the second second-class discipline named Power Machinery and Engineering was further authorized to offer the master and doctoral degrees and to establish a postdoctoral research station, which has been one of the national key disciplines in 2002. In 1997, the Power Engineering and Engineering Thermophysics was authorized to offer the first-class discipline doctorate degree.

There are now 25 professors and 30 doctoral supervisors, 34 associate professors and senior engineers and 53 master supervisors in Power Engineering and Engineering Thermophysics discipline. Among them, two are distinguished professors in the Thousand Talents Plan, two are from the Thousand Young Talents Plan, two are awarded as the National Defense "511" Talents, one is awarded as the Beijing Prominent Educator, three are awarded as New Century Excellent Talents in Ministry of Education of China, and a Defense Technology Innovation Team for the military vehicle power system. Within the D Power Engineering and Engineering Thermophysics discipline, quite a few important laboratories were established: the Beijing Key Laboratory of Clean Vehicles, the National Defense Key Laboratory of Military Power System Technology, the Ministry of Industry and Information Key Laboratory of the High Efficiency and Low Emission ICE Technology, and the National Laboratory of Automobile Power Performance and Emission Test. It also has one of the national level research centers, Clean Energy and Power in the Collaborative Innovation Center for Electric Vehicles.

The main scientific research in Power Engineering and Engineering Thermophysics of BIT includes:

(1) Engineering Thermophysics. The research area of engineering thermophysics is oriented to the needs of the national energy strategy. Based on the aerodynamic thermodynamics, fluid dynamics, heat and mass transfer of heat engines, the theoretical methods and key technologies for energy efficient used in thermal systems are studied. The main research contents include: thermal cycle and its work process, high-efficiency combustion

theory and technology, thermal management of thermal system, theory and method of waste heat recovery of thermal system, complex combined cycle and its adjustment technology. Significant research features have been formed in the areas of efficient combustion, thermal management, and efficient thermal cycling.

(2) Power Machinery and Engineering. The research area of power machinery and engineering is based on internal combustion engines, heat turbines, internal combustion generators, and other new types of power machinery and systems. Based on engineering thermodynamics, fluid mechanics, solid mechanics, materials science, engineering control theory, and modern design methods, the basic theory and key technologies for the efficient, reliable and clean conversion of this form of energy into directly exploitable mechanical or electrical energy is studied. The main research contents include: overall design and performance optimization of power system, power system control theory and technology, reliability and vibration noise of power mechanical structure, turbocharger and emission purification, design of new concept power machinery and system. Among them, the highly-enhanced.

(3) Fluid Machinery and Engineering. In response to major engineering needs in national defense and energy, research is conducted on the functional transformation laws of fluid mechanical devices, the flow processes of complex systems, and key technologies in fluid dynamics. The main research contents include: the internal flow characteristics and control of bladed fluid machinery, cavitation flow mechanism and numerical model research, fluid dynamics in vehicle and power system, the internal flow characteristics of low-temperature medium in high-speed turbo-pump, unsteady flow and fluid-structure interaction, noise prediction and control of fluid machinery, optimal design of fluid machinery, integrated optimal design of water-jet propulsion system and underwater vehicle, and optimal design theory and key technology development of advanced composite propellers. In the high-speed hydrodynamics, especially the cavitation flow and the internal flow stability of fluid machinery, the program has formed a significant research feature.

(4) Energy and Environmental Engineering. The research area of energy and environmental engineering is mainly engaged in the research of pollutant generation mechanism, emission control technology, and pollutant monitoring technology in the process of energy conversion and utilization. It focuses on the research of various pollutant generation mechanisms, control technologies, on-line monitoring technologies, pollutant control regulations and pollution control technology policies; the research of the generation mechanism of various types of conventional and unconventional pollutants in the process of energy conversion and utilization, the mechanism of action and contribution rate of pollution in the atmospheric environment, the impact of various



types of pollution sources on indoor and in-vehicle environments and on human health, and the energy utilization and environmental protection system engineering research. The discipline of energy and environmental engineering integrates the disciplines of thermal sciences, mechanics, materials science, machinery manufacturing, environmental sciences, and electromagnetic radiation, thus it is a composite discipline of energy, environment, and control.

(5) New energy Science and Engineering. The research area of new energy science and engineering focuses on the research of renewable energy such as solar energy, hydrogen energy, and biomass energy, and has connections with energy, materials, chemistry, physics, and biology. This research area studies the basic theory and key technologies for the efficient conversion and utilization of renewable energy. The main research contents include: hydrogen energy and fuel cell's theory and key technologies, hybrid power system energy management and control technology, solar energy efficient utilization theory and technology, high density Power battery system technology, development of new energy and new power devices, etc. This research area formed leading research features in the solar thermal utilization, seawater desalination and hydrogen internal combustion engine development.

## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

### (1) Master student

Master students trained in this subject should have good research ethics and professionalism. They should master the solid basic theory and systematic expertise of the discipline, master the modern experimental methods and the skills of the discipline, and have the ability to engage in scientific research or undertake specialized technologies independently. They should be capable of performing scientific research, engineering design, product development and teaching in research institutes, companies, and universities.

### (2) Ph.D. student

The Ph.D. students cultivated in this subject should have the scientific spirit and the international perspective. They should master a solid and broad basic theory and systematic in-depth expertise of the discipline; master the modern experimental methods and skills of the discipline. They have a certain degree of International academic communication skills; be capable of conducting scientific research independently. They also need to

have a good spirit of cooperation, and be able to make creative achievements in scientific research or technical expertise. Ph.D. students should also master solid and basic theory, systematic specialized knowledge in the field of mechanical engineering, modern experimental methods and skills, international academic exchange ability, the capability of being engaged in scientific research independently, good cooperation spirit and be able to make creative achievements in scientific research or expertise.

### 3. Length of Schooling

The basic length of schooling for master students is 3 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years.

The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1701003	Science and Engineering Calculation 科学与工程算	32	2	1/2	Optional	Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	0301001	Introduction to Advanced Engineering Mathematics 高等工程数学导论	48	3	2	Optional	Master/Ph.D.	
Discipline Core Course	0301002	Fundamentals of Modern Control Theory 现代控制理论基础	48	3	2	Optional	Master	
	0301003	Advanced Mechanical Vibration 高等机械振动	48	3	1	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Discipline Core Course	0301004	Advanced Engineering Thermodynamics and Heat Transfer 高等工程热力学和传热学	48	3	2	Optional	Master	Master $\geq$ 8 Ph.D. $\geq$ 4  Among the Credits of Discipline Core Course: Master $\geq$ 2 Ph.D. $\geq$ 2
	0301005	Computational Fluid Dynamics 计算流体力学	32	2	2	Optional	Ph.D.	
	0301006	Advanced Control Engineering 先进控制工程	32	2	1	Optional	Ph.D.	
	0301007	Fatigue Life Design of Mechanical Structure 机械结构疲劳与寿命设计	32	2	1	Optional	Ph.D.	
	0301016	Energy-saving and new energy vehicle technology 节能和新能源车辆技术	48	3	2	Optional	Master/Ph.D.	
	0301017	Learning-based Intelligent Vehicle technology 智能车辆机器学习技术	48	3	2	Optional	Master/Ph.D.	
Major Optional Course	0301008	Elasticity 弹性力学	32	2	1	Optional	Master	Master $\geq$ 8 Ph.D. $\geq$ 4
	0301009	Structural Optimization Method 结构优化方法	32	2	1	Optional	Master	
	0301010	Modern Measurement Technology 现代测试技术	32	2	2	Optional	Master	
	0301011	Principle of Finite Element Method 有限元原理	32	2	2	Optional	Master	
	0301012	Principle and Application of CAD/CAM/CAE	32	2	1	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course		CAD/CAM/CAE 原理及工程应用						Among the Credits of Discipline Core Course: Master≥2 Ph.D.≥2
	0301013	Engineering Management 工程管理	32	2	2	Optional	Ph.D.	
	0301015	Advanced Technology of Modern Vehicle 现代车辆先进技术	32	2	2	Optional	Ph.D.	
Total Credits	Master≥24 credits                      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

**6. The Dissertation Related Work**

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

Time Nodes of Relevant Procedure

The Dissertation Related Work	Master	Ph.D.
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before Review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Electronics Science and Technology

## 电子科学与技术

(080900)

### 1. Overview of the Program

The electronic science and technology discipline of Beijing Institute of Technology originates from the Academy of Natural Sciences of Yan'an, which was founded by Communist Party of China in 1940. Chinese academician Li Qiang, the "red radio expert", was the founder of the discipline. It is the first discipline in our country to successfully develop a TV transmission and reception test system. It was approved to set up the first-level doctoral site in 2003. It is also a Beijing Key Discipline and Key Discipline of Ministry of Industry and Information Technology.

There are currently 104 full-time teachers in the discipline, including 29 with senior professional titles, 41 with deputy senior professional titles, 67% with senior professional and technical positions, and 88% with doctoral degrees. The faculty includes 2 titled with "Changjiang Scholars" distinguished professors of the Ministry of Education, 2 titled with the National Science Fund for Distinguished Young Scholars, 1 titled with national "Ten Thousand Talents Program" scientific and technological innovation leader, 1 overseas high-level talent, 1 IEEE fellow, and 6 candidates for the national high-level youth talent plan, 3 candidates for the provincial and ministerial talent plan, 1 Beijing Famous teacher and 1 Beijing Famous Young Teacher.

The discipline has a national-level teaching team of "Electrical and Electronic Fundamentals", and has built a series of high-level teaching and scientific research platforms such as "National-level Experimental Teaching Demonstration Center of Electrical Engineering and Electronics", National Defense Key Discipline Laboratory of "Multiple Information Systems", Ministry of Industry and Information Technology Key Laboratory of "Low-Dimensional Quantum Structures and Devices", Beijing Key Laboratory of "Millimeter Wave and Terahertz Technology", Beijing Engineering Technology Research Center of "Silicon-based High-speed System-on-Chip", etc. The discipline undertakes important scientific research projects such as National Key Research and Development Program, National Natural Science Foundation of China key project and major scientific research instrument development project, major national defense projects, and civil aerospace projects. More than 70% of the graduates serve in the national defense and military industry. Among the graduates are many academicians such as Wang Xiaomo, the winner of the National Highest Science and Technology Award. The discipline has become one important talents training base for serving the national strategy and the national civilian economy

territory.

At present, this discipline has formed five advantageous directions with distinctive features, from basic theory to application, including radio frequency technology and software, microwave and terahertz technology, intelligent electronic information system, microelectronics and solid-state electronics and signal and image processing.

### 1) Radio Frequency Technology and Software

Radio frequency (RF) technology is one of the pillars of the electronic information age. Electronic industrial design software is one of the key foundations of the national electronic industry. The design of complex RF systems faces a series of extremely challenging problems such as complex materials, multi-scale, multi-physics, and complex environment electromagnetic compatibility. This direction aims at the major national needs such as the electromagnetic characteristics of targets and stealth design, radar, high-level aircraft communication and detection system development, large-scale integrated circuit design for radio frequency, etc. Here, we carry out research on the electromagnetic heat of radio frequency systems in complex environments, and establish mechanism analysis and calculation models. We independently developed the industrial RF simulation software "SINOCOM", which has served nearly 30 institutes of aviation, aerospace, and electronics. This software has successfully carried out the electromagnetic computing of "tens of thousands of electrical wavelengths, tens of billions of unknowns, and millions of cores in parallel", which won high praise from international authoritative scholars. This direction has established a certain international reputation and influence in the fields of national strategic deployment such as "High Performance Computational Electromagnetics", "Target Feature Engineering", "Stealth Aircraft Design".

### 2) Microwave and Terahertz Technology

The main research areas of this direction include microwave/millimeter wave/terahertz integrated circuits, antennas and systems. We carry out research on integrated RF technology, design technology and system integration technology, such as silicon-based, GaAs-based monolithic and MEMS. We conduct research on microwave and millimeter-wave phased array antennas and MIMO antenna technologies for the 5G applications and the next-generation wireless communication systems. Taking the THz wave transmission and regulation, terahertz detection and identification, terahertz channel modeling and terahertz target characteristics research as the background, we carry out research on terahertz imaging system, terahertz radar system, terahertz communication system, terahertz key functional devices, and terahertz antennas and integrated front-end. Closely combined with national defense and civil needs, we carry out research on millimeter-wave and optical

(laser/infrared/visible light) composite detection, vehicle-mounted millimeter-wave environment and situational awareness, Internet of things wireless sensing and other system technology research, and interdisciplinary research on millimeter and terahertz wave based bio-electromagnetism, accurate multiphysics measurement and quantum correlation.

### 3) Intelligent electronic information system

This direction is oriented towards major national needs, and conducts in-depth research in the fields of intelligent perception, intelligent electromagnetic spectrum warfare, intelligent image processing and pattern recognition. Research includes Radar system and signal processing, Radar/telecommunication intelligent game, Laser/ultraviolet ray/infrared ray detection and identification, remote sensing and implanted sensing, integration of telecommunication detection and interference, integration of telecommunication, navigation and remote sensing, aerospace platform anti-jamming data link, millimeter wave and terahertz telecommunication networking, intelligent image processing, image/video intelligent detection and tracking, intelligent heterogeneous computing, and real-time sensing and storage computing systems, etc. This discipline direction focuses on the integration of theoretical exploration and engineering practice, emphasizing both on algorithm research and system development, and has achieved many achievements in the fields of radar reconnaissance, radar countermeasures, data link anti-jamming, and laser/ultraviolet detection.

### 4) Microelectronics and Solid State Electronics

This direction focuses on the major national needs and "stuck neck" problems in the fields of high-performance, low-power, low-cost semiconductor materials, devices and chips, and deploy interdisciplinary research with physical electronics, superconducting electronics, and flexible electronics. Utilizing advanced measurement and manipulation technology, we carry out the detection of novel quantum physical properties, explore the construction of new low-dimensional quantum functional materials and manipulation methods for quantum property, and study the structural design, energy band engineering, physical property regulation and device construction of new semiconductor materials. Here we provide an important scientific basis for the development of information devices in the future. At the same time, we carry out research on high-performance analog integrated circuit design and application, silicon-based RF/millimeter wave integrated circuit design, system-on-chip (SOC) design, new MEMS sensor design and application, three-dimensional integration and vertical interconnection, etc, towards the development of high-end chips and new micro-nano devices with full intellectual property rights.

### 5) Signal and Image Processing



This direction is oriented towards the international academic frontier fields, such as the integration of new radar system and telecommunication, hybrid brain-computer interface, brain science and brain image processing, intelligent video, and image analysis and recognition. This direction serves the major needs of countries such as intelligent information system integrating reconnaissance, interference, detection and telecommunication, safe operation of power system security, smart ocean, and healthy China, etc. We conduct research on multi-polarization array signal processing and array design, brain magnetic resonance image processing method and clinical application development, visible light and infrared image processing in video security monitoring, insulator state assessment in power system, unmanned operation and maintenance, perception and navigation of intelligent unmanned ships, intelligent wearable health monitoring, hybrid brain-computer interface and emotional level assessment, etc. Our research on polarization-sensitive array signal processing and brain magnetic resonance image processing methods is at the international advanced level, and we have cutting edge and distinctively featured studies in environment perception for intelligent unmanned ship, intelligent algorithm in navigation obstacle avoidance, and intelligent video security monitoring with target tracking and group behavior analysis.

## **2. Training Target**

- 1) To train students to understand the solid basic theory and systematic and specialized knowledge of the discipline, learn the modern experimental methods and skills of the discipline (direction), have an interdisciplinary academic background, and have the ability to engage in scientific research work or independently undertake specialized technical work in the field of Electronic Science and Technology.
- 2) To train high-level, innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

## **3. Length of Schooling**

- 1) The basic length for master students is 2 years. In principle, students must complete the courses in the first academic year. Thesis work time must be at least one year. The maximum length of study for master students can be extended by 0.5 years on the basis of 2 years.
- 2) The basic length for Ph.D. students is 4 years. In principle, students must complete the courses in the first academic year. Thesis work time must be at least three years. The maximum length of study for Ph.D. students can be extended by 2 years at maximum on the basis of 4 years.

## **4. Curriculum and Credit Requirements**

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Requirements	Master /Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master /Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master /Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master /Ph.D.	
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master /Ph.D.	Master≥2 Ph.D.≥2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master /Ph.D.	
	1701007	Modern Regression Techniques in Data sciences 现代回归方法	32	2	1/2	Optional	Master /Ph.D.	
Discipline Core Course	0501004	Modern Antenna Theory and Technology 现代天线理论与技术	32	2	2	Optional	Master	Master≥2 Ph.D.≥2
	1301006	Nano-Electronic Devices and Applications 纳米电子器件及应用	32	2	1	Optional	Master /Ph.D.	
	1301021	Radar remote sensing and channel modeling 微波遥感与信道建模	32	2	1	Optional	Master	
Major Optional Course	0501005	RF Circuit Design Theory and Application 射频电路设计理论与应用	32	2	2	Optional	Master	Master≥6 Ph.D.≥2
	0501009	Foundation of FPGA and SoPC Design FPGA 与 SoPC 设计基础	32	2	2	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Requirements	Master /Ph.D.	Credits Requirement
Major Optional Course	0501011	Multi-source Data Fusion Theory and Application 多源数据融合理论与应用	32	2	2	Optional	Master	Master≥6 Ph.D.≥2
	0501014	Advanced Digital Communication 高等数字通信	32	2	1	Optional	Master	
	0501021	Probability, Radom Process and Stochastic Geometry in Engineering 概率、随机过程和随机几何及其应用	32	2	1	Optional	Master	
	0501022	Medical Image Processing and Artificial Intelligence 医学图像处理与人工智能	32	2	1	Optional	Master	
	1301004	Fundamentals of MEMS Transducers MEMS 原理	32	2	1	Optional	Master /Ph.D.	
	1301005	Microfabrication for IC and MEMS I 集成电路工艺 I	32	2	1	Optional	Master /Ph.D.	
	1301019	Semiconductor Optoelectronics 半导体光电子学	32	2	2	Optional	Master	
	1301026	MEMS Design MEMS 设计	32	2	2	Optional	Master /Ph.D.	
	1301027	Microfabrication of IC and MEMS II 集成电路工艺 II	32	2	2	Optional	Master /Ph.D.	
	1301028	Introduction to Biophotonics 生物光子学	32	2	1	Optional	Master /Ph.D.	
	1301029	Integrated Microsystems 智能集成微系统	32	2	2	Optional	Master /Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Requirements	Master /Ph.D.	Credits Requirement
Major Optional Course	1301030	Advanced MEMS -- Optical MEMS MEMS 专题—光学	16	1	2	Optional	Master /Ph.D.	Master≥6 Ph.D.≥2
	1301031	Advanced MEMS -- Acoustic MEMS MEMS 专题—声学	16	1	2	Optional	Master /Ph.D.	
	1301032	Advanced MEMS -- BioMEMS MEMS 专题—生物	16	1	2	Optional	Master /Ph.D.	
	1301033	Advanced MEMS -- CMOS MEMS Integration MEMS 专题—CMOS-MEMS 集成技术	16	1	2	Optional	Master /Ph.D.	
	1301034	Advanced MEMS -- Thermal MEMS MEMS 专题—热电	16	1	2	Optional	Master /Ph.D.	
	1301035	Advanced MEMS -- Inertial MEMS MEMS 专题—惯性	16	1	2	Optional	Master /Ph.D.	
	1301036	Advanced MEMS -- Resonant MEMS MEMS 专题—谐振	16	1	2	Optional	Master /Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1). Public Courses

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2) Basic Courses

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3) Discipline Core Courses

Different Programs can set their own Discipline Core Course.

#### 4) Major Optional Courses

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

## 5. Practice Part

### 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

### 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time Nodes of Relevant Procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference and Lecturer Introduction.

# Information and Communication Engineering

## 信息与通信工程

(081000)

### 1. Overview of the Program

This program is the engineering field to construct the modern information society with the combination of information technology. It solves the technical problems of electronic components, integrated circuit, electronic control, instrumentation, computer design and manufacturing and those related to electronics and communication engineering using the basic theory of information technology and studies the theory and technology of electronic information detection, transmission, exchanging, processing and display.

This program is a full-time degree, including both coursework and projects. It aims at cultivating the high-level specialized personnel with a firm grasp of basic theories and professional knowledge of electronics and communication engineering, having the ability to solve practical problems and undertake the tasks for professional technology or management. Students can apply for the master degree after getting required credits. They will participate in projects in electronics and communication engineering under the guidance of their advisors and complete their graduation thesis based on the projects they have conducted.

This discipline studies communication system theory and technology, mobile communication theory and technology, signal and image processing, information processing theory and technology, theory and technology in information security and countermeasures, and target detection and recognition theory and technology.

### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should

not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
	1701007	Modern Regression Techniques in Data Sciences 现代回归方法	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	0501001	Fundamentals of Statistical Signal Processing 统计信号处理基础	32	2	1	Compulsory	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	0501002	Information Theory 信息论	32	2	1	Compulsory	Master/Ph.D.	
	0501003	Introduction to Radar Systems 雷达系统导论	32	2	1	Compulsory	Master/Ph.D.	
Major Optional Course	0501004	Modern Antenna Theory and Technology 现代天线理论与技术	32	2	2	Optional	Master/Ph.D.	Master $\geq$ 6 Ph.D. $\geq$ 2
	0501005	RF Circuit Design Theory and Application 射频电路设计理论与应用	32	2	2	Optional	Master/Ph.D.	



Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Major Optional Course	0501022	Medical Image Processing and Artificial Intelligence 医学图像处理与人工智能	32	2	1	Optional	Master/Ph.D.	Master≥6 Ph.D.≥2
	0501009	Foundations of FPGA and SoPC Design FPGA 与 SoPC 设计基础	32	2	2	Optional	Master/Ph.D.	
	0501020	Mobile Communications 移动通信	32	2	2	Optional	Master/Ph.D.	
	0501011	Multi-source Data Fusion Theory and Application 多源数据融合理论与应用	32	2	2	Optional	Master/Ph.D.	
	0501012	Digital Speech Signal Processing 语音信号数字处理	32	2	1	Optional	Master/Ph.D.	
	0501013	Fundamentals of Communication Networks 通信网络基础	32	2	2	Optional	Master/Ph.D.	
	0501014	Advanced Digital Communications 高等数字通信	32	2	1	Optional	Master/Ph.D.	
	0501016	Quantum Radar Principle 量子雷达原理	32	2	1	Optional	Ph.D.	
	0501017	High Resolution Radar 高分辨雷达	32	2	1	Optional	Ph.D.	
	0501021	Probability, Random Process and Stochastic Geometry in Engineering 概率、随机过程和随机几何及其应用	32	2	1	Optional	Master	
	0501024	Microwave Photonics	32	2	1	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course		微波光子学						Master≥6 Ph.D.≥2
	0501007	Advanced optical fiber communication systems 先进光纤通信系统	32	2	1	Optional	Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3. Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4. Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time Nodes of Relevant Procedure**

The Dissertation Related Work	Master	Ph.D.
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference and Lecturer Introduction.

# Control Science and Engineering

## 控制科学与工程

(081100)

### 1. Overview of the Program

The first-level discipline “Control Science and Engineering” has a Post-doctoral research station. The discipline was selected to enter the list of “Double-First Class” discipline construction plan by the Ministry of Education in 2017. It was evaluated as a Class A discipline in the fourth round of discipline assessment by the Ministry of Education. The second-level disciplines under the first-level discipline are “Intelligent sensing and motion control”, “Pattern Recognition and Intelligent Systems”, “Navigation, Guidance and Control”, “Control Theory and Control Engineering”, “Intelligent Information Processing and Control” and “Electrical Engineering and Control”. “Control Theory and Control Engineering” was honored as a National Key Discipline; “Navigation, Guidance and Control” was honored as a National Key Cultivating Discipline; “Pattern Recognition and Intelligent Systems” was honored as a State Commission of Science and Technology for National Defense Industry Key Discipline; “Control Science and Engineering” was honored as a Key First-Level Discipline of Beijing.

Control Science and Engineering studies on moving objects, industrial equipment and human-computer-object fusion systems. It aims to enhance the ability of human beings to understand and change the world. This discipline uses the knowledge of information technology, computer technology, test technology, artificial intelligence and basic knowledge of research objects to do research on system modeling, dynamic analysis, prediction, control and decision making. The discipline focuses on the combination of theoretical research and engineering applications, interdisciplinary research and military-civilian integration, and has played a major role in the development of our national economy and the defense of national security.

The main research directions of this discipline are:

- (1) Intelligent sensing and motion control: Advanced technology for sensors and testing; Transmission and control of electricity, liquid and gas; New-type actuators and automation equipment; Intelligent instruments and controllers; Integration and networking of measurement and control systems; Fault diagnosis and tolerance of measurement and control systems; Medical signal detection and intelligent medical instruments.
- (2) Pattern Recognition and Intelligent Systems: Intelligent control and intelligent systems; Computational

intelligence and optimal decision making; Pattern recognition and machine learning; Image comprehension and computer vision; Multi-agent synergetic control; Command control and decision systems; Intelligent control of unmanned systems; Distributed simulation of complex systems.

(3) Navigation, Guidance and Control: Inertial navigation for positioning and orientation; Integral navigation and intelligent navigation; Inertial devices and system testing; Bionic navigation; Geophysical field information matching assisted navigation; Guidance, control and simulation of aircraft; New-type inertial devices; Multi-source navigation information sharing and control.

(4) Control Theory and Control Engineering: Modeling, control, optimization, decision and simulation of complex systems; Robust control and self-adaptive control; Nonlinear filtering and control; Integrated control and optimization of engineering systems; Design and analysis of motion control systems; Advanced control theory and methodologies; Biomedical information processing; Autonomous control of unmanned systems.

(5) Intelligent Information Processing and Control: Systems engineering theory and its applications; Modeling, optimization and synthesis of systems; Analysis and control of complex systems; Network information processing and control; Neural network and deep learning; Fault diagnosis and reliability analysis; cloud control systems and its application.

(6) Electrical Engineering and Control: Power electronics conversion and control; Motor control and new-type motor design; High precision servo control; Renewable energy technology and its applications; New energy power systems and control; Control and management of smart grid; Theory and new technology of electrical engineering.

## **2. Training Target**

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

## **3. Length of Schooling**

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should

not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	0601003	Stochastic Processes Theory and Applications 随机过程理论及应用	32	2	1	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
Major Optional Course	0601001	Linear Algebra in Automatic Control 自动控制中的线性代数	48	3	1	Compulsory	Master	Master $\geq$ 6 Ph.D. $\geq$ 2
	0601002	Linear Systems Theory 线性系统理论	48	3	1	Compulsory	Master	
	0601004	Optimal and Robust Control 最优与鲁棒控制	32	2	2	Optional	Master/Ph.D.	
	0601005	Computer and Distributed Control Systems 计算机与分布式控制系统	32	2	2	Optional	Master/Ph.D.	
	0601006	Kalman Filter and Multisensor Data Fusion 多源信息滤波与融合	32	2	2	Optional	Master/Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course	0601007	Systems Engineering Principles and Applications 系统工程原理与应用	32	2	1	Optional	Master /Ph.D.	Master≥6 Ph.D.≥2
	0601008	Modern Power Electronics 现代电力电子学	32	2	2	Optional	Master /Ph.D.	
	0601009	Game Theory and Control 博弈论与控制	32	2	2	Optional	Master /Ph.D.	
	0601010	Robot Perception 机器人感知	32	2	2	Optional	Master /Ph.D.	
	0600002	Progress in Control Science 控制科学进展	48	3	1	Compulsory	Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2. Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3. Major Course

## (1) Discipline Core Course

Different Programs can set their own Discipline Core Course.

## (2) Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

## 4. Courses in Chinese

Foreign students can take courses in Chinese from the program for the Academic Graduate Students.

## 5. Practice Part

### 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

### 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of BIT*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review & Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.



# Computer Science and Technology

## 计算机科学与技术

(081200)

### 1. Overview of the Program

The disciplines of Computer science and technology of Beijing Institute of Technology root in the Computer Major established in 1958 as one of the first in China. In 1980, the Department of Computer Science and Engineering was formally formed. In 2009, it is restructured into School of Computer Science. The school has made prominent contributions to the development of teaching, research and industry in computer science and technology in China. The school has obtained the authorization of doctoral degree grant on the first-class discipline of Computer science and technology, the key discipline of Beijing on Computer Application Technology, the key discipline on Computer Software, and the Post-doctoral Mobile Stations for Computer Science and Technology.

Computer science is the study of how computational processes and devices represent, store, and manipulate information. It involves the development, and analysis of algorithms, which are instructions (or software) that tell a computer how to solve particular problems correctly and efficiently. The program of Computer Science and Technology provides intensive preparation in the concepts and techniques related to the design, programming, researching and application of computing systems. Students are provided a deep understanding of both fundamentals and important current issues in computer science and computer engineering so that they may either obtain productive employment or pursue advanced degrees.

This is a full-time degree program, involving both coursework and research projects. It aims at cultivating the high-level specialized personnel with a firm grasp of basic theories and professional knowledge of computer science and technology, with the ability to solve practical problems and undertake the tasks for professional technology. Students will be awarded with the Master/PhD degree after getting required credits. They will participate in research or project in computer science and technology under the guidance of his or her supervisor and complete their graduation thesis based on the projects they have conducted.

### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate

students into full play as a cultural bridge.

### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

### 4. Curriculum and Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1700001	Numerical analysis 数值分析	32	2	1/2	Optional	Master/Ph.D.	
	1701007	modern regression techniques in data sciences 现代回归方法	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	0701001	Computer Science and Technology Frontier 计算机科学与技术前沿	32	2	1	Compulsory	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	0701002	Theory of Computation 计算理论	32	2	2	Optional	Master/Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Major Optional Course	0701003	Advanced Operating Systems 高级操作系统	32	2	1	Optional	Master/Ph.D.	Master $\geq$ 6 Ph.D. $\geq$ 2
	0701004	Machine Learning and Knowledge Discovery 机器学习与知识发现	32	2	2	Optional	Ph.D.	
	0701005	Computer Graphics and Image Processing 计算机图形与图像处理	32	2	2	Optional	Master/Ph.D.	
	0701006	Web Mining Web 挖掘	32	2	1	Optional	Master/Ph.D.	
	0701007	Theory of Algorithms and Algorithmic Complexity 算法与算法复杂性理论	32	2	2	Optional	Master/Ph.D.	
	0701008	Social Network Analysis 社交网络分析	32	2	2	Optional	Master/Ph.D.	
	0701010	Content Management and Digital Library 内容管理与数字图书馆技术	32	2	1	Optional	Master/Ph.D.	
	0701011	Wireless Network and Mobile Computing 无线网络与移动计算	32	2	2	Optional	Master/Ph.D.	
	0701013	Network and Information Security 网络与信息安全	32	2	1	Optional	Master/Ph.D.	Master $\geq$ 6

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Major Optional Course	0701014	Advanced Computer Networks 高级计算机网络	32	2	1	Optional	Master/Ph.D.	Ph.D.≥2
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:****1. Public Course**

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

**2. Basic Course**

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

**3. Discipline Core Course**

Different Programs can set their own Discipline Core Course.

**4. Major Optional Course**

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part****1. Academic Activity (1 credit)**

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

**2. Innovative Practice (1 credit)**

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

**6. The Dissertation Related Work**

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before Review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference and Lecturer Introduction.

# Chemical Engineering and Technology

## 化学工程与技术

(081700)

### 1. Overview of the Program

Chemical Engineering and Technology discipline of Beijing Institute of Technology is originated from the department of chemical engineering of Yan'an Academy of Natural Sciences which was founded in 1940. In 1952, department of chemical engineering and department of chemistry of Institut Franco-Chinoisof were merged to form the Department of Chemical Engineering of Beijing Institute of Technology, where famous teachers gathered together and laid the foundation for the development of the discipline.

The discipline was authorized to confer master's degree in Chemical Engineering in 1982, doctor's degree in Applied Chemistry in 1984, master's degree in Chemical Technology and Biochemical Engineering in 1998, doctor's degree in Chemical Technology and Biochemical Engineering in 2003 and 2005 respectively, master's degree in Chemical Engineering and Technology in 2006, and doctor's degree in Chemical Engineering and Technology. In 2002, Applied Chemistry became the national key discipline, and it was recognized as the key basic discipline of Ministry of Industry and Information Technology in 2007. In 2012, Chemical Engineering and Technology was recognized as the key discipline of Ministry of Industry and Information Technology. In 2003, the post-doctoral station of Chemical Engineering and Technology was established. There are 31 PhD supervisors in the discipline, including 1 Cheung Kong Scholars Program distinguished professor, 2 winners of National Outstanding Youth Science Fund, 2 new century talents, 1 innovation team of the Ministry of Education. The discipline has Chemical power and green catalytic Beijing key laboratory, "Fuel cell distributed generation technology" international science and technology cooperation base, "Pharmaceutical Molecular Science and Pharmaceutical Engineering" of the Ministry of Industry and Information Technology key laboratory.

Through the hard work of several generations of colleagues for more than half a century, the discipline has developed a teaching and research system with obvious advantages and distinctive characteristics. The research direction extensively involves the basic theory and applied technology in the fields of new energy, applied chemistry, organic chemistry, biological chemistry, pharmaceutical engineering and so on. The discipline undertook a number of national and local major basic and applied research projects, reflecting the great demand of the frontiers of science and national economy. People in this discipline won many awards including Second Prize of National Natural Science Award and second prize of National Scientific and Technological Progress

Award. A large number of outstanding talents have been cultivated, including Academician Xu Gengguang, Academician Dong Haishan and Academician Cui Guoliang.

The discipline is globally ranked 100th to 150th in the 2021 QS World University Rankings. In the fourth round of national discipline evaluation results released by the Ministry of Education in 2017, the discipline of Chemical Engineering and Technology ranked A-.

The main research directions are as follows:

1. Chemical power and green catalysis

This direction is mainly focused on electrochemical engineering, energy storage & conversion and green catalysis, had a strong advantage in the research and industrialization of solid oxide fuel cell, power system and battery.

2. Chemical engineering

This direction is mainly focused on the interface phenomena in the transfer process of multiphase systems, the basic laws of thermodynamics and dynamics of transfer and reaction processes, process intensification, integration and recombination of chemical processes, including the transfer mechanism intensification of reaction and separation processes, the coupling, simulation and controlling of integration and operation of reaction separation processes, novel membrane materials and membrane process, special separation materials and separation process, and catalytic materials and catalytic process, etc.

3. Applied Chemistry

This direction is mainly focused on the synthesis of energetic materials, physical and chemical properties and safety evaluation, synthesis technology of polyazocyclic compounds, biochemical sensing technology of explosives and dangerous goods, conductive film materials and flame retardant materials, etc.

4. Novel drug creation and green synthesis

This direction is mainly focused on novel drugs, preparations, intermediates and synthesis technology, green and chiral synthesis technology, advanced manufacturing technology of special fluorine containing fine chemicals, synthesis technology and performance of functional ionic liquid materials.

5. Biochemical engineering

This direction is mainly focused on biomedical engineering, biocatalytic engineering, metabolic engineering and synthetic biology, space biotechnology, biological separation and analysis technology, etc., with the advantages in biomedical engineering, natural product biosynthesis, anti-stress biotransformation and engineering applications, new biological reactions and enzyme design and transformation.

## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

## 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
	1701007	Modern Regression Techniques in Data Sciences 现代回归方法	32	2	1/2	Optional	Master/Ph.D.	



Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Discipline Core Course	1001012	Pharmaceutic-al Dosage Forms and Technology 药物制剂与工艺	32	2	1	Optional	Master /Ph.D.	Master $\geq 2$ Ph.D. $\geq 2$
	1001013	Synthetic Biotechnology 合成生物技术	32	2	2	Optional	Master /Ph.D.	
	1001020	Chemistry and Chemical Engineering Statistical Thermodynamics 化学与化学工程统计热力学	48	3	2	Optional	Master /Ph.D.	
	1001021	Heterogeneous Catalysis For Energy Applications 能源应用当中的多相催化	32	2	1	Optional	Master /Ph.D.	
	1001022	Principles of Membranes and Membrane Processes 膜与膜过程原理	32	2	2	Optional	Master /Ph.D.	
	1001023	Carbon neutral chemical technology 碳中和化工技术	32	2	1	Optional	Master /Ph.D.	
Major Optional Course	1001011	Chemical Biology 化学生物学	32	2	2	Optional	Master /Ph.D.	Master $\geq 6$ Ph.D. $\geq 2$
	1001014	Drug Design 药物分子设计	32	2	1	Optional	Master /Ph.D.	
	1001017	Coordination Chemistry 配位化学	32	2	1	Optional	Master /Ph.D.	
	1001018	X-Ray Crystallography X 射线晶体学	32	2	1	Optional	Master /Ph.D.	
	1001006	Spectrometric	32	2	1	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
		Identification of Organic Compound 有机波谱分析					/Ph.D.	
	1001024	Advanced Instrumental Analysis 高等仪器分析	32	2	2	Optional	Master /Ph.D.	
	1001025	Organometallic Chemistry 金属有机化学	32	2	2	Optional	Master /Ph.D.	
	1001026	Fundamentals of Materials Science and Engineering 材料科学与工程基础	32	2	2	Optional	Master /Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1).Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2) Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3) Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4) Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1) Academic Activity (1 credits)

International Graduate Students need to participate in academic activities, academic lectures and academic

conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2) Innovative Practice (1 credits)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Aeronautics & Astronautics Science & Technology

## 航空宇航科学与技术

(082500)

### 1. Overview of the Program

Aerospace engineering is the primary branch of engineering concerned with the design, construction, operation and those of related to flight vehicles. It consists of two major branches: aeronautical engineering and astronautical engineering, respectively dealing with flight vehicles that operate inside and outside the Earth's atmosphere. The full-time graduate student program of Aerospace Engineering will provide our students with opportunities for further development in aerospace technical areas, aiming at cultivating the high-level professionals with solid theoretical and practical background in aerospace engineering. This program involves both fundamental courses and research project. Coursework will focus on aerospace fundamentals, mainly including guidance and control, fluid mechanics, and propulsion. The project will investigate challenging and fundamental problems in aerospace science and technology under the guidance of a supervisor.

### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

### 1. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	0101005	Control Theory 控制理论	32	2	1	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	0101006	Orbital Mechanics 轨道力学	48	3	1			
	0101003	Fundamentals of Aerospace Propulsion 宇航推进原理	48	3	1			
	0101015	Fluid Mechanics 流体力学	48	3	2			
Major Optional Course	0101004	Guidance and Control Theory for Flight Vehicle 飞行器制导与控制理论	32	2	1	Optional	Master/Ph.D.	Master $\geq$ 6 Ph.D. $\geq$ 2
	0101013	Optimal Control 最优控制	32	2	2			
	0101016	Analytical Mechanics and Nonlinear Control for Spacecraft Attitude 航天器姿态分析力学与非线性控制	32	2	2			
	0101017	Cooperative Control over Networked Systems and its Applications 网络系统的协同控制及其应用	32	2	2			
	0101018	Modern Aircraft Configuration Design 现代飞行器布局设计	32	2	2			

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course	0101007	Reactive Flow in Jet Propulsion 喷气反应流	32	2	2	Optional	Master /Ph.D.	Master $\geq$ 6 Ph.D. $\geq$ 2
	0101011	Introduction of Combustion Instability 燃烧不稳定性概论	32	2	2			
	0101019	Introduction to Unmanned Intelligent Swarm 无人智群导论	32	2	2			
Total Credits	Master $\geq$ 24 credits      Ph.D. $\geq$ 20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2. Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different programs can set their own basic course.

## 3. Major Course

## (1) Discipline Core Courses

Different Programs can set their own Major Core Course.

## (2) Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**2. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic

conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 3. The Dissertation Related Work

### 1. Literature Review & Opening Report

Under the guidance of the supervisor, International Graduate Students should pick a research direction as well as reading certain amount reference books, both Chinese or foreign languages, at the same time.

Master students should write a literature review, no less than 4000 words, based on the reading of over 30 papers, both Chinese and foreign languages, of their own research field.

Ph.D. students should write a literature review, no less than 5000 words, based on the reading of over 50 papers, both Chinese or foreign languages, of their own research field.

On the basis of the Literature Review, the Opening Report should mainly introduce following factors: research target, research meaning, and methods of research, technical route, implementary plan, arrangements and expected results.

### 2. Mid-Term Evaluation (for Ph.D. students)

Schools organize Mid-Term Evaluation for International Students, which includes the evaluations of course study, literature review, opening report and the research progress of publishing papers and writing of Degree thesis.

### 3. Thesis Writing and Thesis Pre-Defense (for Ph.D. students)

International Graduate Students should complete a Degree thesis under the guidance of supervisors. Ph.D. students can take the Thesis Pre-Defense after finishing a supervisor-approved first draft.

### 4. Thesis Defense

After thesis approved and the Sub-Committee of Degree Assessment authorized, International Graduate Students can take the Thesis-Defense.

### 5. Degree Conferment

International students should acquire certain academic results as regulated when applying for a Master or Ph.D.

Degree. Each program should clarify the categories of Master Degree and Ph.D. Degree.

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*.

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

#### 4. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.



# Armament Science and Technology

## 兵器科学与技术

(082600)

### 1. Overview of the Program

The Armament Science and Technology Discipline, founded in 1950s, is the earliest national defense discipline in China and has been qualified to recruit PhD students since 1984. In 2007, it is awarded the national first-level discipline and ranks Top 1 in the national assessments in 2008, 2012, and 2017. The discipline now takes pride in our research groups with profound academic knowledge, reasonable structure, solidify cooperation, innovation, and outstanding contributions, and is led by a lot of talent researchers including academician, Chang Jiang scholars, National Outstanding Experts, etc. The discipline consists of the Science and Technology Innovation Team and the National Defense Science and Technology Innovation Team honored by Ministry of Education and the Ministry of Industry Information Technology. Together with National Key Laboratory, National Defense Science and Technology Key Laboratory, and the Key Laboratory of the Ministry of Education, a high-level innovative research platform is provided.

The Armament Science and Technology is consist of six secondary disciplines as following:

(1) Weapon Design and Application Engineering. It mainly studies theory and method of weapon system design, weapon integration and system confrontation, integrated design of weapon and platform, weapon launch and ballistic planning, unmanned aerial vehicle system technology, intelligent robot, precision guided weapon, intelligent and dexterous weapon cross-domain coordination accusation technology and new probability, the new concept of system, and so on.

(2) Damage Technology and Ammunition Engineering. It mainly studies damage mechanism and theory, warhead technology, ammunition design theory, damage assessment, integrated damage, ammunition and platform integration, photo electricity and magnetic damage, cyber damage, new concept of damage, and so on.

(3) Explosion Theory and Impact Engineering. It mainly studies theory of detonation and explosion, shock dynamics of material and structure, theory and application of high speed penetration, calculation of explosion mechanics, shock wave physics and chemistry, underwater explosion and impact, mechanism of biological damage, hypervelocity collision, new concept explosion theory, and so on.

(4) Energetic Materials and Special Energy. It mainly studies high energy density compounds, green energetic compounds, high energy mixed explosives, complex system energetic materials, high active energy storage materials, high efficiency functional materials, advanced pyrotechnics, military pyrotechnics and materials, special energy devices and materials, solid state storage batteries and materials, new concept energetic materials, new concepts of energy, and so on.

(5) Target Detection and Ammunition Information. It mainly studies target detection, ammunition intelligent control, weapon terminal information confrontation, ammunition information, intelligent information processing, intelligent cluster technology, damage control, single soldier equipment digitalization, new concept of detection technology, and so on.

(6) Safety Technology and Protection Engineering. It mainly studies design of weapon safety, ammunition safety technology, protection theory and technology, advanced protective material and structure, intelligent security technology, anti-terrorism and explosion-proof technology, wearable protection, new concept of protection technology, and so on.

## 2. Training Target

The target is to train high-level innovative talents who have good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

## 4. Curriculum and Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master /Ph.D.	Master=14 Ph.D.=14
Basic Courses	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master /Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master /Ph.D.	
	1701007	modern regression techniques in data sciences 现代回归方法	32	2	1/2	Optional	Master /Ph.D.	
Discipline Core Course	0201007	Engineering Design of Conventional Warheads 常规战斗部工程设计	32	2	1	Optional	Master	Master $\geq$ 2 Ph.D. $\geq$ 2
	0201008	Mobile Computing 移动计算	32	2	2		Master /Ph.D.	
	0201009	Chemistry of energetic materials 含能材料化学	32	2	1		Master /Ph.D.	
	0201010	Continuum Mechanics 连续介质力学	32	2	2		Master /Ph.D.	
	0201011	Dynamic Behaviors of Materials 材料动态力学行为	32	2	2		Master /Ph.D.	
Major Optional Course	0201006	Flight Dynamics Principles 飞行系统动力学	32	2	2	Optional	Master /Ph.D.	Master $\geq$ 6 Ph.D. $\geq$ 2
	0201018	Theory of elasticity 弹性理论	32	2	1		Master /Ph.D.	
	0201012	Physical Gas Dynamic 气体动力学	32	2	1		Master /Ph.D.	
	0201013	Micro- & nanoscale Energetic Materials and Devices 微纳含能材料与器件	32	2	2		Master /Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course	0201014	Molecular dynamics theory and computation 分子动力学理论与计算	32	2	1	Optional	Master /Ph.D.	Master≥6 Ph.D.≥2
	0201015	Structural Response to Blast Loading 结构冲击动力学响应	32	2	2		Master /Ph.D.	
	0201016	Shock physics and chemistry 冲击波物理与化学	32	2	1		Master	
	0201005	Safety Engineering: Theory and Practice 安全工程：理论与实践	32	2	2		Master /Ph.D.	
	0201001	Introduction to Combustion and Detonation 燃烧与爆轰基础	32	2	1		Master /Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3. Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4. Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D.

international students can take undergraduate courses if needed.

## 5. Practice Part

### 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

### 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time Nodes of Relevant Procedure**

The Dissertation Related Work	Master	Ph.D.
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before Review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Safety Science and Engineering

## 安全科学与工程

(083700)

### 1. Overview of the Program

The construction of safety science and engineering relies on the State Key Laboratory of Explosive Science and Technology (Beijing Institute of Technology), which has established a discipline system featuring combustion and explosion safety. The discipline has a high academic level, a reasonable structure of the academic team and advanced systematic research platform, to provide superior conditions for personnel training and scientific research.

This subject develops postgraduate training programs according to first-level disciplines. There are five major research directions.

1. Systematic safety theory and evaluation: Multi-factor system safety theory and method, system safety evaluation theory and method, hazard identification and evaluation method, accident causation theory under multi-factor cooperation, risk analysis and evaluation of complex system, Regional quantitative risk assessment (AQRA) theory and methods.
2. Dangerous substances and safety engineering: hazardous characteristics of inflammable and explosive and other dangerous substances, critical explosion criteria, hazard identification, reaction mechanism and safety theory, design, preparation and safety of flammable and explosive hazardous substances.
3. Disaster evolution dynamics: kinetic theory of the initiation, propagation, combustion and explosion of explosive hazards, the induction mechanism and process of explosion accidents, environmental conditions and physical and chemical properties of hazards, etc.
4. Safety monitoring and accident reconstruction: real-time on-line monitoring of system parameters before accidents and accidents, rapid disposal of insecure conditions, on-sits and effects, accident investigation and analysis, and accidents Prevent emergency plans.
5. Engineering safety and control technology: Engineering safety system research, major dangerous installations and accident prevention, emergency plan design, blasting engineering safety theory, engineering blasting effect and shock absorption control technology, engineering disaster numerical simulation technology.

## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

## 4. Curriculum and Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
	1701007	modern regression techniques in data sciences 现代回归法	32	2	1/2	Optional	Master/Ph.D.	
Discipline Core Course	0201001	Introduction to Combustion and Detonation 燃烧与爆轰基础	32	2	1	Compulsory	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	0201002	Combustion and Explosion	32	2	2	Optional	Master/Ph.D.	Master $\geq$ 6 Ph.D. $\geq$ 2

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional course		Measurement Technology 燃烧与爆炸测试基础						Master≥6 Ph.D.≥2
	0201003	Principals of System Safety Evaluation 系统安全评估原理	32	2	2	Optional	Master /Ph.D.	
	0201004	Introduction & Application of Hazardous Chemicals 危险化学品概论及应用	32	2	2	Optional	Master	
	0201005	Safety Engineering: Theory and Practice 安全工程：理论与实践	32	2	2	Optional	Master	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Discipline Core Course

Academic postgraduates and PhD students should take at least 2 credits of Discipline Core Course.

## 3. Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic



conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time Nodes of Relevant Procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Thesis Pre-Defense	——	Before Review
Thesis Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference, and Lecturer Introduction.

# Cyberspace Science

## 网络空间安全

(083900)

### 1. Overview of the Program

The program of network and information security comprises four major directions, including Cyberspace Security Fundamentals, Cryptography and Application, Space Network and Secure Communication, and Information Security and Confrontation. This program is designed to meet the critical demand of cyberspace security and is intended to both exercise the concept of "new engineering" to cultivate talents and train students who possess solid theoretical, professional and practical abilities in the fields of information security, computer and network engineering and advanced computing and information security (i.e. artificial intelligence security, data security, etc.). Furthermore, in this program we can systematically master the professional knowledge of electromagnetic space security, cyberspace security, computing system security and Internet governance. The program of network and information security is the main construction specialty of the college, which mainly serves the general needs of various industries for talents in cyberspace science and technology. The employment rate is among the highest across all fields and the career prospect is promising.

### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

### 3. Length of Schooling (学制)

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master /Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master /Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master /Ph.D.	
Basic Course	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master /Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master /Ph.D.	
	1701007	Modern Regression Techniques in Data Sciences 现代回归方法	32	2	1/2	Optional	Master /Ph.D.	
DisciplineCore Course	1201005	网络空间安全导论 Introduction to Cybersecurity	32	2	1	Optional	Master /Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
Major Optional Course	1201001	数字媒体安全 Digital Media Security	32	2	2	Optional	Master /Ph.D.	Master $\geq$ 6 Ph.D. $\geq$ 2
	1201002	移动通信安全理论 与技术 Mobile Communications: Threats and Countermeasures	32	2	2	Optional	Master /Ph.D.	
	1201003	智能信号处理 Intelligent Signal Processing	32	2	2	Optional	Master /Ph.D.	
	1201004	物联网安全 Internet of Things Security	32	2	1	Optional	Master /Ph.D.	
TotalCredits	Master $\geq$ 24credits Ph.D. $\geq$ 20credits							

#### Notes:

##### 1).Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required

course.

(2)Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2)Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3)Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4) Major OptionalCourse

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

# 5. Practice Part

## 1)Academic Activity (1 credits)

International Graduate Students need to participate in academic activities, academiclectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2)Innovative Practice (1 credits)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

# 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

**7. Course Syllabus**

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Management Science and Engineering

## 管理科学与工程

(120100)

### 1. Overview of the Program

Management Science and Engineering was established in 1980. Our program is the first batch of universities that are approved to offer the degree of Management Science and Engineering. The program has mainly five research areas: Decision-making theory and methods, Information Management and Information Systems, System Reliability and Risk Management, Complex System Modeling and Management Systems Engineering, and Knowledge Management and Innovation Management.

### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

### 4. Curriculum and Credit Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=12 Ph.D.=12
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	Master=2 Ph.D.=2

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Basic Courses	2101001	Intermediate Microeconomics 中级微观经济学	32	2	1/2	Optional	Master	Master≥2 Ph.D.≥2
	2101002	Advanced Microeconomics 高级微观经济学	32	2	1/2	Optional	Ph.D.	
	2101003	Research Methodology 研究方法	32	2	1/2	Optional	Master	
Discipline Core Course	2101004	Efficiency and Productivity Analysis of Energy and Environment 能源环境效率与生产率分析	32	2	1/2	Optional	Master /Ph.D.	Master≥2 Ph.D.≥2
	2101005	Industry Green Management and Optimization 行业绿色管理及优化	32	2	1/2	Optional	Master /Ph.D.	
Major Optional Course	2101006	Management Information Systems 管理信息系统	32	2	1/2	Optional	Master	Master≥6 Ph.D.≥2
	2101007	Operations Research 运筹学	48	3	1/2	Optional	Master	
	2101008	Intermediate Econometrics 中级计量经济学	32	2	1/2	Optional	Master	
	2101009	Macroeconomics 宏观经济学	32	2	1/2	Optional	Master /Ph.D.	
	2101010	Advanced Econometrics 高级计量经济学	32	2	1/2	Optional	Master /Ph.D.	
Total Credits	Master≥24 credits                      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Basic Course

Different Programs can set their own Basic Course.

## 3. Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4. Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

# 5. Practice Part

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

# 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester



The Dissertation Related Work	Master	Ph.D.
Mid-Term Evaluation	---	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	---	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference and Lecturer Introduction.

# Business Administration

## 工商管理

### (120200)

#### 1. Overview of the Program

Business administration discipline was founded in 1980. The degree-granting of master's degrees in enterprise management secondary discipline was received in 1990. And the degree-granting of doctor's degrees in enterprise management secondary discipline was received in 2003. The enterprise management secondary discipline was rated as priority subject of Beijing in 2006. The degree-granting of master's degrees in technological economics and management secondary disciplines was added in 2001. And the degree-granting of master's degrees in accounting secondary disciplines was added in 2005. The center for post-doctoral studies in business administration first-level discipline was added in 2009. Besides, the degree-granting of doctor's degrees in business administration first-level discipline was received in 2010. Business administration discipline for the bachelor's degree includes three discipline: marketing discipline, accounting discipline and business administration discipline.

After thirty years of construction and development, our college has achieved fruitful results and accumulated rich experience in education and scientific research of the undergraduate, master's graduate students, PhD, MBA, and EMBA. And our college has transported a large number of senior management personnel to the society.

Our college has a strong faculty in business administration first-level discipline with a distinctive professional direction. There are nearly 50 full-time teachers, including 12 Professors, 23 Associate Professors, and 11 doctoral supervisors. The discipline consists of 6 research directions: military and civilian integration and organization innovation, technological economics and management, innovation management and sustainable development, organizational behavior and human resource management, marketing, and accounting and financial management. Besides, there are EMBA, MBA and accounting professional master degree in the discipline. As a result, business administration first-level discipline in our college almost includes all professional fields from bachelor's degree to doctor's degree. In addition, according to the structure of the administrative organization of our college, business administration first-level discipline includes the department of technological economics and management, the department of marketing, the department of accounting, and the department of human resources management.

The fields and advantages of the disciplines are as follows:

(1) Military and civilian integration and organization innovation: this discipline highlights the characteristics of national defense and military industry. It breaks through military and civilian integration development, organization mode and innovation methods to adapt to the wide demand of national development and social progress. It focuses on the scientific and technological innovation system construction with the combination of military and civilian, the bidirectional overflow, expansion and transfer of military and civilian integration technology, the organization innovation and mechanism design, the high-level innovation team construction, human resources development strategy in science and technology and so on.

(2) Technological economics and management: First, this discipline center on national independent innovation strategy. And it focuses on technological innovation, technology diffusion, industrial transfer, regional economy and emerging strategic industry development to provide significant decision basis for government. Second, it pays attention to the practical problems in national economy development, and it researches the theories and methods of technology economy evaluation, the decision evaluation of large scale construction projects and enterprises' investment and financing projects. Third, it focuses on technological catching-up and surpassing strategy, and it researches the significant theoretical and practical problem in enterprise technological innovation, high-tech industrial zones, science and technology management evaluation system, innovative science and technology industrial development strategy, national science and technology policy. Fourth, it follows the academic frontier, and it researches Internet + Innovation mode, crowd sourcing, crowd funding, sharing economy and green innovation.

(3) Innovation management and sustainable development: this discipline centers on the major nation strategic demands and national economic hot issue in the innovation and sustainable development fields. In the process of building an innovation-oriented country, faced with increasingly severe resource and environmental problems, China has to focus on the sustainable development in economy, environment and society. As a result, the discipline is problem-oriented. It combines innovation theories with sustainable development theories. Based on Chinese situation, the discipline focuses on theories and methods of green technology innovation management, theories and methods of industrial (enterprise) ecological innovation management, theories and policy modeling of circular economy and low-carbon economic, green supply chain, reverse logistics management, innovation and entrepreneurship management.

(4) Organizational behavior and human resource management: this discipline focuses on enterprise employees'

health and safety, floating population health risks, emergency and industrial policy with some specific methods, such as theoretical analysis, simulation modeling, game analysis and empirical research.

(5) Marketing: based on practice, this discipline focuses on the enterprise marketing strategy, international operation, brand management, business model innovation, consumer behavior, marketing performance, relationship marketing, green marketing, strategic marketing transformation of military and civilian integration, enterprise business ethics and social responsibility in the new situation.

(6) Accounting and financial management: this discipline pays attention to firm contracts, accounting information quality, internal control and informatization, incentive and evaluation of human resources, enterprise merger, enterprise reorganization and theories and methods of project investment and financing decision analysis.

## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

## 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	2101009	Macroeconomics 宏观经济学	32	2	1/2	Optional	Master/Ph.D.	Master≥2 Ph.D.≥2

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Basic Course	2101002	Advanced Microeconomics 高级微观经济学	32	2	1/2	Optional	Ph.D.	Master≥2 Ph.D.≥2
Discipline Core Course	2101008	Intermediate Econometrics 中级计量经济学	32	2	1/2	Optional	Master	Master≥2 Ph.D.≥2
	2101010	Advanced Econometrics 高级计量经济学	32	2	1/2	Optional	Master /Ph.D.	
Major Optional Course	2101001	Intermediate Microeconomics 中级微观经济学	32	2	1/2	Optional	Master	Master≥6 Ph.D.≥2
	2101007	Operations Research 运筹学	48	3	1/2	Optional	Master	
	2101016	International Finance 国际金融学	32	2	1/2	Optional	Master	
	2101005	Industry green management and optimization 行业绿色管理及优化	32	2	1/2	Optional	Master /Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Basic Course

Different Programs can set their own Basic Course.

## 3. Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4. Major Optional Course

International students should choose course from their own program or from other programs. Under the

guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

## 5. Practice Part

### 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

### 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

### Time nodes of relevant procedure

The Dissertation Related Work	Master	Ph.D.
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference and Lecturer Introduction.

# Master of Business Administration

## 工商管理硕士

(125100)

### 1. Overview of the Program

Beijing Institute of Technology, resuming management education and establishing graduate school in 1980s, was authorized by Ministry of Education to be one of the first two batches of 26 universities in China with the right to confer MBA degrees. In 1994, Beijing Institute of Technology started to recruit MBA students. After more than twenty years' development, its MBA program has become one of the most influential and branded MBA, which has passed the AMBA international accreditation in 2011 and re-accreditation in 2014. In 2015, the School of Management & Economics (SME) has passed the EQUIS accreditation, becoming the seventh business school in mainland China to pass both the EQUIS and AMBA accreditations. In 2016, the SME has successfully passed Chinese Advanced Management Education Accreditation, which is the 13th university in China to obtain the accreditation. In 2018, the SME was re-accredited by EQUIS and in 2019, the SME successfully passed the AACSB accreditation, becoming a business school with three major accreditations, which is achieved by less than 1% of business schools in the world.

Adhering to the rigorous academic attitude, the MBA program of Beijing Institute of Technology has been always attaching great importance to high quality of teaching and paying great attention to the combination of theory and practice. Also, the MBA program of Beijing Institute of Technology takes the advantage of coordinated development of our university's science, engineering, management and art disciplines. Besides that, through providing quality educational system and systematic professional training, the MBA program of Beijing Institute of Technology has developed excellent management talents who aware general operating rules of economic market, understand the situation of China, have a global vision, a sense of social responsibility and team work spirit, possess efficient and progressive personality, for Chinese enterprises and institutions, multinational enterprises and international organizations. After more than twenty years' development, the MBA program of Beijing Institute of Technology has become a distinctive MBA program with professional faculties, solid discipline foundation, outstanding student teams, diverse teaching methods, rich teaching achievements, good teaching environment, and perfect management system.

## 2. Training Target

The MBA program of Beijing Institute of Technology devotes to cultivating students' professional quality of benefiting the people and society with sincerity and honesty and behaving according to morality and law. Also, we devote to training excellent management talents with a global vision, a sense of social responsibility and team work spirit as well as efficient and progressive personality. Moreover, MBA talents are required to have strong analysis, judgment, decision-making, organizational and leadership skills as well as the courage to develop, hard work and entrepreneurial and pioneering spirit. Besides that, they are also required to have a healthy and confident mentality and be good at communication and coordination. The graduates should be able to qualify in the middle or senior management positions in all kinds of enterprises and institutions.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. The time to complete the thesis should not be less than one year. The maximum length of study for master students is two and half years.

## 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master	16
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master	
	3701007	Business Ethics and Corporate Social Responsibility 商业伦理与企业社会责任	32	2	1/2	Compulsory	Master	



Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Basic Course	2101019	Managerial Economics 管理经济学	32	2	1/2	Compulsory	Master	4
	2101023	Strategic Management (For Professional Degree) 战略管理 (专硕)	32	2	1/2	Compulsory	Master	
Discipline Core Course	2101020	Operation Management 运作管理	32	2	1/2	Compulsory	Master	14 (For Students with Specialization in International Organization & Global Governance, 16)
	2101024	Managerial Statistics 管理统计学	32	2	1/2	Compulsory	Master	
	2101021	Accounting 会计学	32	2	1/2	Compulsory	Master	
	2101025	Financial Management 财务管理	32	2	1/2	Compulsory	Master	
	2101026	Marketing Management 市场营销管理	32	2	1/2	Compulsory	Master	
	2101022	Human Resource Management 人力资源管理	32	2	1/2	Compulsory	Master	
	2101027	Management Information System 管理信息系统	32	2	1/2	Compulsory	Master	
	2101052	International Organization and International Law 国际组织和国际法	32	2	1/2	Compulsory for Students with Specialization in International Organization & Global Governance	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Major Optional Course	2101028	International Business Management 国际商务管理	32	2	1/2	Optional	Master	
	2101029	Intercultural Management (For MBA) 跨文化管理	32	2	1/2	Optional	Master	
	2101030	International Business Law 国际商法	32	2	1/2	Optional	Master	
	2101053	Enterprise Resource Planning and Digital Operation 企业资源计划与数字化运营	32	2	1/2	Optional	Master	
	2101044	Supply Chain Management in Digital Intelligence Era 数智时代的供应链管理	32	2	1/2	Optional	Master	
Major Optional Course	2101045	Energy Policy and Enterprise Management Practice 能源政策与企业管理实践	32	2	1/2	Optional	Master	≥8 (For Students with Specialization in International Organization & Global Governance, ≥6)
	2101034	Entrepreneurship and Family Business Management 创业与家族企业管理	32	2	1/2	Optional	Master	
	2101035	Entrepreneurial Management 创业管理	32	2	1/2	Optional	Master	
	2101036	Innovation & Revolution Management 创新与变革管理	32	2	1/2	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Major Optional Course	2101037	Brand Management(For Professional Degree) 品牌管理 (专硕)	32	2	1/2	Optional	Master	≥8 (For Students with specialization in International Organization & Global Governance, ≥6)
	2101038	Art of Leadership 管理者的领导艺术	32	2	1/2	Optional	Master	
	2101039	Organizational Behavior 组织行为学	32	2	1/2	Optional	Master	
	2101040	Employee Relations 员工关系管理	32	2	1/2	Optional	Master	
	2101041	International Finance (For MBA) 国际金融	32	2	1/2	Optional	Master	
	2101046	Service Management 服务管理	32	2	1/2	Optional	Master	
	2101047	E-commerce and Big Data 电子商务与大数据	32	2	1/2	Optional	Master	
	2101048	Public Relations and Crisis Management 公共关系与危机管理	32	2	1/2	Optional	Master	
	2101049	Climate Change and Sustainable Development 气候变化与可持续发展	32	2	1/2	Optional	Master	
	2101050	Fundamentals of Global Governance 全球治理概论	32	2	1/2	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
	2101051	Global Competence 全球胜任力	32	2	1/2	Optional	Master	≥8 (For Students with Specialization in International Organization & Global Governance, ≥6)
Total Credits	Master≥42 credits							

**Notes:**

## 1) Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2) Major Optional Course

International students should choose courses from their own program. Under the guidance of the supervisor, international students in the master program can take undergraduate courses if needed. International students in the PhD program can take undergraduate courses if needed.

3) The credits of Discipline Core Course can be counted into the credits of Major Optional Course.

**5. Compulsory Part**

## 5.1 Literature Retrieval and Thesis Writing (1credit)

MBA students need to attend a training program about Literature Retrieval and Thesis Writing organized by School of Management & Economics.

## 5.2 Practice Part (1 credit)

MBA students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by their supervisors. The report should be more than 3000 words.

## 5.3 Innovative, Entrepreneurial and International Organization Activities (1 credit)

MBA students need to participate in at least 4 seminars about innovation, entrepreneurship, international organization, global governance or other topics about business administration, and write a report of each seminar, to summarize content of the seminar and illustrate their academic opinions. Each report should be more than

800 words.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>
Literature Review& Opening Report	Before the end of the 2 <sup>nd</sup> semester
Mid-Term Evaluation	Week 1-2 of the 4 <sup>th</sup> semester
Thesis Defense	At least 9 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Thesis Defense

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference and Lecturer Introduction.

# Design

## 设计学

### (130500)

## 1. Overview of the Program

The faculty of this discipline is strong. Interdisciplinary research and an equal emphasis on ‘science and humanities’ are featured; moreover, the development of design innovation and comprehensive abilities are valued.

There are five research directions for postgraduate students of Design Master:

### (1) Industrial Design

The main research contains product innovation design, user requirements analysis, form design and interaction design.

### (2) Environmental Design

It established a research system which includes multi-faceted, systematic, theoretical and practical of ‘planning, architecture, landscape and interior’, with the core of spatial environment.

### (3) Visual Communication Design

The main research contains information visualization design, font and graphic creativity, digital media, etc.

### (4) Artistic Innovation Design

Based on ‘cultural heritage’ and ‘traditional arts and crafts’, it focuses on exploring the sustainable development of excellent traditional culture by innovation design.

### (5) Experimental Art

It stimulates the spirit of artistic creation with artistic practice, to explore contemporary art theory and artistic creation language.

## 2. Training Target

The target is to train high-level innovative talents in Design who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses

in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years.

#### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master	Master=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master	
Basic Course	2500095	Art & Design Cultural Trend 设计与艺术文化思潮	32	2	1	Compulsory	Master	Master $\geq$ 2
Discipline Core Course	2500055	Design Methods Research 设计方法研究	32	2	1	Compulsory	Master	Master $\geq$ 2
Major Optional Course	2500072	Visual Design and Aesthetics 视觉设计与审美	32	2	2	Optional	Master	Master $\geq$ 6
	2500069	Analysis of Environmental Space Form 环境空间形态解析	32	2	2	Optional	Master	
	2500075	Interaction Design and User Experience Research 交互设计与用户体验研究	32	2	2	Optional	Master	
	2500076	Painting Form and Concept 绘画形式与观念	32	2	2	Optional	Master	
	2500066	Heritage Regeneration design 遗产再生设计	32	2	2	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course	2501001	Color Design and Research (in English) 色彩设计与研究 (全英文)	32	2	2	Optional	Master	Master≥6
	2501002	Behavior and Decision-Making Research (in English) 行为与决策研究 (全英文)	32	2	2	Optional	Master	
Total Credits	Master≥24 credits							

**Notes (说明):**

## 1) Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2) Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed.

**5. Practice Part**

## 1) Academic Activity (1 credits)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2) Innovative Practice (1 credits)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

**6. The Dissertation Related Work**

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Thesis Defense; 4. Degree Conferment



More Details can be found in *Regulations of Training Procedures for International Graduates of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester
Mid-Term Evaluation	———
Dissertation Pre-Defense	———
Dissertation Defense	At least 9 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Integrated Circuit Science and Engineering

## 集成电路科学与工程

(140100)

### 1. Overview of the Program

The *Integrated Circuit Science and Engineering* (ICSE) discipline at Beijing Institute of Technology (BIT) has a long history that can be traced back to 1960 when the major of Semiconductor Materials and Devices was founded as one of the oldest majors in Electronics and Devices in China. Over the past 60 years, The ICSE discipline at BIT has always insisted on educating fostering high-end and urgently-needed talents for the country. In 2016, BIT was selected to establish the National Demonstration School of Microelectronics as an exemplary model; then in 2021, BIT was approved to set up a doctoral site for the discipline of *Integrated Circuit Science and Engineering*. This is one of the first batch of doctoral programs for this discipline in China and also the first batch of universities selected for the National Integrated Circuit Projects aiming at educating high-level talents in a short supply. The ICSE discipline at BIT focuses on the key issues in the fields of Integrated Circuits and aims to fulfill the major strategic requirements of the country as well as to lead the world frontier in science and technology. Our ICSE also persists leading to an engineering-oriented road with the combination of production and research, which may serve for the national defense in the future. This also helps to form an interdisciplinary layout with the majors of electronics, materials, information, optics, etc., as well as a joint school-enterprise training program with industry leaders such as *Empyrean Technology Co., Ltd.*, *NAURA Technology Group Co., Ltd.*, the 6<sup>th</sup> Research Institute of China Electronics and Piotech Inc.

There are currently 90 full-time faculty in this discipline, including 33 professors and 37 associate professors. 80% of the faculty have overseas experience. In our faculty, there are two distinguished professors entitled with “Yangtze River Scholars”, two professors entitled with “Outstanding Youth”, one professor honored as the technological innovation leader, one professor honored with the High-level Overseas Project, one IEEE Fellow, and six national scholars in the High-level Youth Talent Project. In addition, there are also one faculty member honored as the “Famous Teacher” and one as the “Young Famous Teacher” in Beijing.

The discipline of *Integrated Circuit Science and Engineering* has high-level laboratories such as the Key Laboratory of Low-Dimensional Quantum Structures and Devices of the Ministry of Industry and Information Technology, the Beijing Key Laboratory of Millimeter Wave and Terahertz Technology, the Beijing Engineering

Technology Research Center for Silicon-based High-speed Systems on a Chip, the National Defense Key Discipline Laboratory of Multiple Information Systems and the National Demonstration Center for Electrical and Electronics Experimental Teaching. There are also school-local cooperation institutions built together with the local governments like the BIT Chongqing Center for Microelectronics and Microsystems, the Innovation Center of MEMS/NEMS Devices and Systems (Yangtze River Delta Graduate School) and so on. Until now, the total laboratory area is nearly 10,000 square meters and the total value of experimental equipment exceeds 100 million Yuan.

The discipline undertakes scientific research projects such as the National Key R&D Projects, the projects of National Natural Science Foundation of China, the Outstanding Youth Projects, the Excellent Youth Project, the major projects of the Science and Technology Commission of the Military Commission, and key projects of the Beijing Science and Technology Plan, with an average annual research funding of over 100 million Yuan. A series of international and domestic leading achievements have been made in the fields of new low-dimensional quantum structures and devices, intelligent MEMS micromirrors, special processing chips and system applications for spaceborne signals, etc. The discipline consists of four main research directions that are described below.

### **1) Integrated Micro-Nano Electronics Science**

Aiming at the major strategic requirements of the country in the field of Integrated Circuits, *Integrated Micro-Nano Electronics Science* carries out research on low-dimensional electronic materials, extreme bandgap semiconductor materials like ultra-wide bandgap semiconductors, as well as the device construction based on these materials, including new concept devices, power semiconductor devices, long-wavelength and solar-blind detection devices, etc. The goal is to develop intelligent, lightweight, miniaturized and multi-functional integrated extreme bandgap semiconductor functional devices, as well as provide insights into their applications in the major national strategic fields such as power transmission, new energy vehicles, high-frequency communication, and intelligent perception. The direction aims at cultivating professionals in the direction of micro-nano electronics, therefore creating a special direction of *Integrated Micro-Nano Electronics Science* in BIT, as well as promoting the discipline of Integrated Circuits and its related fields.

### **2) MEMS and Integrated Microsystems**

*MEMS and Integrated Microsystems* is dedicated to the design and fabrication of MEMS micro-nano sensors and actuators as well as microfluidic chips, featuring optical MEMS, acoustic MEMS, resonant MEMS, and the integration of CMOS-MEMS. It emphasizes on the joint interdisciplines of electronics, optics, acoustics,

thermal and material science, and biology, aiming to develop intelligent, multi-energy-domain, lightweight, miniaturized, and integrated microsystems with multi-functions, which can be further applied in the major national strategic fields such as intelligent sensing, intelligent manufacturing, precision medicine, unmanned driving, intelligent environmental protection, smart robots, remote sensing, and telemetry. This direction is aimed at cultivating high-quality engineers in the fields of *MEMS and Integrated Microsystems* and promoting the development of integrated circuits as well as the related disciplines.

### 3) Integrated Circuit Design and Advanced Packaging

To meet the major national requirements in the fields of new-generation radar information systems, low-orbit satellite Internet, and high-efficiency signal processing, *Integrated Circuit Design and Advanced Packaging* has been focusing on the following directions: the design methods and theory of integrated circuit, the design of analog and mixed-signal integrated circuit, the design and applications of silicon-based RF/millimeter wave integrated circuit, the system-on-chip (SOC) design. Aiming at major scientific issues such as new design theories, new functional devices, and new micro-nano systems for integrated circuits in the post-Moore era, the direction have been dedicated to the fields of three-dimensional vertical interconnection technology, transition board and heterogeneous integration technology, sensor-memory-computing integrated design technology, as well as basic and applied research on new forms of information devices. The goal is to feature advantages in the fields of millimeter-wave ASIC design, through-silicon via (TSV) complete process with small diameter, ultra-high aspect ratio and ultra-high depth, ultra-large-scale special signal processing chip design and application, special anti-irradiation chips for aerospace applications, etc.

### 4) Flexible Electronic Devices and Intelligent Manufacturing

Aiming at multiple bottlenecks faced by flexible electronic devices in terms of structure design, preparation of semiconductor materials, large-scale manufacturing technologies and development of special equipment, etc., *Flexible Electronic Devices and Intelligent Manufacturing* is dedicated to develop new structures, new functional devices and systems in the post-Moore era. Through the in-depth interdisciplinary of microelectronics, optoelectronics, quantum information, materials, mechanics, biomedicine, and artificial intelligence, etc., this direction aims to develop flexible intelligent robot perception (vision, touch, smell), bionic sensors and systems for precision medicine and personalized physiotherapy, as well as multifunctional flexible and wearable electronic systems. The goal is to cultivate professionals in the field of flexible electronics with an international perspective, and to develop Integrated Circuits and its related disciplines.

## 2. Training Target (培养目标)

- 1) To train students to understand the solid basic theory and systematic and specialized knowledge of the discipline, learn the modern experimental methods and skills of the discipline (direction), have an interdisciplinary academic background, and have the ability to engage in scientific research work or independently undertake specialized technical work in the field of Integrated Circuit Science and Engineering.
- 2) To train high-level, innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

### 3. Length of Schooling

- 1) The basic length for master students is 2 years. In principle, students must complete the courses in the first academic year. Thesis work time must be at least one year. The maximum length of study for master students can be extended by 0.5 years on the basis of 2 years.
- 2) The basic length for Ph.D. students is 4 years. In principle, students must complete the courses in the first academic year. Thesis work time must be at least three years. The maximum length of study for Ph.D. students can be extended by 2 years at maximum on the basis of 4 years.

### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Courses	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Courses	1701002	Matrix Analysis 矩阵分析	32	2	1/2	Optional	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	1701003	Science and Engineering Calculation 科学与工程计算	32	2	1/2	Optional	Master/Ph.D.	
	1701007	Modern Regression Techniques in Data Sciences 现代回归方法	32	2	1/2	Optional	Master/Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Discipline Core Courses	1301004	Fundamentals of MEMS Transducers MEMS 原理	32	2	1	Optional	Master/Ph.D.	Master $\geq 2$ Ph.D. $\geq 2$
	1301005	Microfabrication for IC and MEMS I 集成电路工艺 I	32	2	1	Optional	Master/Ph.D.	
	1301006	Nano-Electronic Devices and Applications 纳米电子器件及应用	32	2	1	Optional	Master/Ph.D.	
Major Optional Courses	0501004	Modern Antenna Theory and Technology 现代天线理论与技术	32	2	2	Optional	Master	Master $\geq 6$ Ph.D. $\geq 2$
	0501005	RF Circuit Design Theory and Application 射频电路设计理论与应用	32	2	2	Optional	Master	
	0501009	Foundation of FPGA and SoPC Design FPGA 与 SoPC 设计基础	32	2	2	Optional	Master	
	0501011	Multi-source Data Fusion Theory and Application 多源数据融合理论与应用	32	2	2	Optional	Master	
	0501014	Advanced Digital Communication 高等数字通信	32	2	1	Optional	Master	
	0501021	Probability, Radom Process and Stochastic Geometry in Engineering 概率、随机过程和随机几何及其应用	32	2	1	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Major Optional Courses	0501022	Medical Image Processing and Artificial Intelligence 医学图像处理与人工智能	32	2	1	Optional	Master	Master $\geq 6$ Ph.D. $\geq 2$
	1301019	Semiconductor Optoelectronics 半导体光电子学	32	2	2	Optional	Master	
	1301021	Radar remote sensing and channel modeling 微波遥感与信道建模	32	2	1	Optional	Master	
	1301026	MEMS Design MEMS 设计	32	2	2	Optional	Master/Ph.D.	
	1301027	Microfabrication of IC and MEMS II 集成电路工艺 II	32	2	2	Optional	Master/Ph.D.	
	1301028	Introduction to Biophotonics 生物光子学	32	2	1	Optional	Master/Ph.D.	
	1301029	Integrated Microsystems 智能集成微系统	32	2	2	Optional	Master/Ph.D.	
	1301030	Advanced MEMS -- Optical MEMS MEMS 专题—光学	16	1	2	Optional	Master/Ph.D.	
	1301031	Advanced MEMS -- Acoustic MEMS MEMS 专题—声学	16	1	2	Optional	Master/Ph.D.	
	1301032	Advanced MEMS -- BioMEMS MEMS 专题—生物	16	1	2	Optional	Master/Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Courses	1301033	Advanced MEMS -- CMOS MEMS Integration MEMS 专题—CMOS-MEMS 集成技术	16	1	2	Optional	Master /Ph.D.	Master≥6 Ph.D.≥2
	1301034	Advanced MEMS -- Thermal MEMS MEMS 专题—热电	16	1	2	Optional	Master /Ph.D.	
	1301035	Advanced MEMS -- Inertial MEMS MEMS 专题—惯性	16	1	2	Optional	Master /Ph.D.	
	1301036	Advanced MEMS -- Resonant MEMS MEMS 专题—谐振	16	1	2	Optional	Master /Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1). Public Courses

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2) Basic Courses

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3) Discipline Core Courses

Different Programs can set their own Discipline Core Course.

## 4) Major Optional Courses

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international



students can take undergraduate courses if needed.

## 5. Practice Part

### 1) Academic Activity (1 credits)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

### 2) Innovation Practice (1 credits)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*.

### Time nodes of relevant procedure

The Dissertation Related Work	Master	Ph.D.
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# National Economy Mobilization

## 国民经济动员学

(0202J1)

### 1. Overview of the Program

The National Economy Mobilization Discipline was founded in 2002 and was approved in the same year as a key construction discipline for the State Commission of Science and Technology for National Defense Industry of the “10th Five-year Plan”. In 2003, with the approval of the Ministry of Education, under the first-level discipline of "Management Science and Engineering", the second-level discipline of "National Economy Mobilization" was independently established; In 2004, it became an important supporting discipline for the "985 Project" (Phase II) of the "National Defense Science and Technology Management and National Defense Mobilization" Philosophy and Social Science Innovation Base of Beijing Institute of Technology; In 2005, it passed the review of experts organized by the Academic Office of the State Council; in 2008, it was approved by the Ministry of Industry and Information Technology as a national defense Characteristic discipline (ministerial key discipline). In 2011, the Ministry of Education approved the establishment of the nation's first doctoral program for national economy mobilization based on three first-level disciplines: management science and engineering, applied economics, and business management.

The discipline of national economy mobilization is an interdisciplinary subject supported by first-level disciplines such as management science and engineering, applied economics, and business management. With the goal of cultivating high-level personnel in fields such as national economy mobilization, military-civil integration, national defense mobilization, and emergency management, adhering to the concept of talent cultivation that combines teaching, research, and practice. In scientific research, it pays attention to the systematic summarization and research of practical problems. In teaching, it pays attention to the cultivation of the practical ability of doctoral and postgraduate students. With regard to the construction of the teaching staff, a first-class faculty has been formed which consists of full-time teachers, well-known domestic experts and scholars.

Through the construction of more than ten years, the teaching and research capability of the national economy mobilization discipline has taken a leading position in China. Many doctoral and master's degree students cultivated in our school has become the senior management talents and businesses backbones in the field of national economy mobilization and national defense mobilization, and has laid a solid foundation for

safeguarding China's national security.

## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

## 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	2101008	Intermediate Econometrics 中级计量经济学	32	2	1/2	Optional	Master	Master $\geq$ 2 Ph.D. $\geq$ 2
	2101010	Advanced Econometrics 高级计量经济学	32	2	1/2	Optional	Ph.D.	
Discipline Core Course	2101011	Economics of defense policy 国防政策经济学	32	2	1/2	Compulsory	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	2101009	Macroeconomics 宏观经济学	32	2	1/2	Compulsory	Master/Ph.D.	
	2101001	Intermediate Microeconomics 中级微观经济学	32	2	1/2	Compulsory	Master	
	2101002	Advanced Microeconomics	32	2	1/2	Compulsory	Ph.D.	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
		高级微观经济学						
Major Optional Course	2101006	Management information systems 管理信息系统	32	2	1/2	Optional	Master	Master≥6 Ph.D.≥2
	2101007	Operations Research 运筹学	48	3	1/2	Optional	Master	
	2101012	International Trade 国际贸易理论与政策	32	2	1/2	Optional	Master	
	2101013	Development Economics 发展经济学（管理）	32	2	1/2	Optional	Master	
	2101014	Intercultural Management 跨文化管理	32	2	1/2	Optional	Master	
	2101015	Laws and Regulations of the World Trade Organization 世界贸易组织法律法规	32	2	1/2	Optional	Master	
	2101016	International Finance 国际金融学	32	2	1/2	Optional	Master	
	2101017	Selective Readings in Energy Economics and Climate Policy 能源与气候经济文献选读	32	2	1/2	Optional	Master	
	2101004	Efficiency and productivity analysis of energy and environment 能源环境效率与生产率分析	32	2	1/2	Optional	Master	
	2101005	Industry green management and optimization	32	2	1/2	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course		行业绿色管理及优化						Master≥6 Ph.D.≥2
	2101018	Classic Literature on International Trade 国际贸易经典文献	32	2	1/2	Optional	Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2. Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3. Major Course

## (1) Discipline Core Courses

Different Programs can set their own Major Core Course.

## (2) Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

### Time nodes of relevant procedure

The Dissertation Related Work	Master	Ph.D.
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# National Economy Mobilization

## 国民经济动员学

(1201J2)

### 1. Overview of the Program

The National Economy Mobilization Discipline was founded in 2002 and was approved in the same year as a key construction discipline for the State Commission of Science and Technology for National Defense Industry of the “10th Five-year Plan”. In 2003, with the approval of the Ministry of Education, under the first-level discipline of "Management Science and Engineering", the second-level discipline of "National Economy Mobilization" was independently established; In 2004, it became an important supporting discipline for the "985 Project" (Phase II) of the "National Defense Science and Technology Management and National Defense Mobilization" Philosophy and Social Science Innovation Base of Beijing Institute of Technology; In 2005, it passed the review of experts organized by the Academic Office of the State Council; in 2008, it was approved by the Ministry of Industry and Information Technology as a national defense Characteristic discipline (ministerial key discipline). In 2011, the Ministry of Education approved the establishment of the nation's first doctoral program for national economy mobilization based on three first-level disciplines: management science and engineering, applied economics, and business management.

The discipline of national economy mobilization is an interdisciplinary subject supported by first-level disciplines such as management science and engineering, applied economics, and business management. With the goal of cultivating high-level personnel in fields such as national economy mobilization, military-civil integration, national defense mobilization, and emergency management, adhering to the concept of talent cultivation that combines teaching, research, and practice. In scientific research, it pays attention to the systematic summarization and research of practical problems. In teaching, it pays attention to the cultivation of the practical ability of doctoral and postgraduate students. With regard to the construction of the teaching staff, a first-class faculty has been formed which consists of full-time teachers, well-known domestic experts and scholars.

Through the construction of more than ten years, the teaching and research capability of the national economy mobilization discipline has taken a leading position in China. Many doctoral and master's degree students cultivated in our school has become the senior management talents and businesses backbones in the field of

national economy mobilization and national defense mobilization, and has laid a solid foundation for safeguarding China's national security.

## 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge.

## 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

## 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master/Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master/Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master/Ph.D.	
Basic Course	2101008	Intermediate Econometrics 中级计量经济学	32	2	1/2	Optional	Master	Master $\geq$ 2 Ph.D. $\geq$ 2
	2101010	Advanced Econometrics 高级计量经济学	32	2	1/2	Optional	Ph.D.	
Discipline Core Course	2101011	Economics of defense policy 国防政策经济学	32	2	1/2	Compulsory	Master/Ph.D.	Master $\geq$ 2 Ph.D. $\geq$ 2
	2101009	Macroeconomics 宏观经济学	32	2	1/2	Compulsory	Master/Ph.D.	
	2101001	Intermediate Microeconomics 中级微观经济学	32	2	1/2	Compulsory	Master	



Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master/Ph.D.	Credits Requirement
Discipline Core Course	2101002	Advanced Microeconomics 高级微观经济学	32	2	1/2	Compulsory	Ph.D.	Master≥2 Ph.D.≥2
Major Optional Course	2101006	Management information systems 管理信息系统	32	2	1/2	Optional	Master	Master≥6 Ph.D.≥2
	2101007	Operations Research 运筹学	48	3	1/2	Optional	Master	
	2101012	International Trade 国际贸易理论与政策	32	2	1/2	Optional	Master	
	2101013	Development Economics 发展经济学（管理）	32	2	1/2	Optional	Master	
	2101014	Intercultural Management 跨文化管理	32	2	1/2	Optional	Master	
	2101015	Laws and Regulations of the World Trade Organization 世界贸易组织法律法规	32	2	1/2	Optional	Master	
	2101016	International Finance 国际金融学	32	2	1/2	Optional	Master	
	2101017	Selective Readings in Energy Economics and Climate Policy 能源与气候经济文献选读	32	2	1/2	Optional	Master	
	2101004	Efficiency and Productivity Analysis of Energy and Environment	32	2	1/2	Optional	Master	

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Major Optional Course		能源环境效率与生产率分析						Master≥6 Ph.D.≥2
	2101005	Industry Green Management and Optimization 行业绿色管理及优化	32	2	1/2	Optional	Master	
	2101018	Classic Literature on International Trade 国际贸易经典文献	32	2	1/2	Optional	Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

**Notes:**

## 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this required course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this required course.

## 2. Basic Course

If the mathematic courses listed in the chart can't meet the requirement, different Programs can set their own Basic Course.

## 3. Major Course

## (1) Discipline Core Courses

Different Programs can set their own Major Core Course.

## (2) Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

**5. Practice Part**

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are

highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

## 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference.

# Energy Economics and Climate Policy

## 能源与气候经济学

(0202J2)

### 1. Overview of the Program

Energy Economics and Climate Policy is an interdisciplinary discipline formed by three primary disciplines: Management Science and Engineering, Applied Economics and Mechanical Engineering. It conducts researches on energy economics, climate policy and environmental management armed with qualitative and quantitative tools, aiming to provide scientific basis for public and private decisions in strategy planning and management that are needed to cope with China's increasing demand for energy as well as the challenges of adapting to and mitigating climate change.

The program has mainly four research areas: Energy, climate and economic development, Energy and climate policy modeling, Energy market and carbon market, new energy and electric vehicle industry policy.

### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge. Students should master the solid foundational theories and expertise of energy economics and climate policy discipline, and have the ability to independently engage in scientific research.

### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.

#### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
Public Course	3700005	Chinese Language I 基础汉语 I	96	6	1	Compulsory	Master /Ph.D.	Master=14 Ph.D.=14
	3700006	Chinese Language II 基础汉语 II	96	6	2	Compulsory	Master /Ph.D.	
	3700002	Outline of China 中国概况	32	2	1/2	Compulsory	Master /Ph.D.	
Basic Course	2101042	Energy and Environment Nexus: Policy Implications 能源与环境的关系: 政策含义	32	2	1/2	Optional	Master /Ph.D.	Master≥2 Ph.D.≥2
Discipline Core Course	2101017	Selective Readings in Energy Economics and Climate Policy 能源与气候经济文献选读	32	2	1/2	Optional	Master /Ph.D.	Master≥2 Ph.D.≥2
Major Optional Course	2101004	Efficiency and productivity analysis of energy and environment 能源环境效率与生产率分析	32	2	1/2	Optional	Master /Ph.D.	Master≥6 Ph.D.≥2
	2101005	Industry green management and optimization 行业绿色管理及优化	32	2	1/2	Optional	Master /Ph.D.	
	2101043	Sustainable Economic Growth and International Energy Situation 可持续经济增长与国际能源形势	32	2	1/2	Optional	Master /Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

#### Notes:

##### 1. Public Course

(1) Chinese Language: Set by International Students Center of BIT. All international students must take this

compulsory course.

(2) Outline of China: Set by International Students Center of BIT. All international students must take this compulsory course.

## 2. Basic Course

Different Programs can set their own Basic Course.

## 3. Discipline Core Course

Different Programs can set their own Discipline Core Course.

## 4. Major Optional Course

International students should choose course from their own program or from other programs. Under the guidance of the supervisor, Master international students can take undergraduate courses if needed. Ph.D. international students can take undergraduate courses if needed.

# 5. Practice Part

## 1. Academic Activity (1 credit)

International Graduate Students need to participate in academic activities, academic lectures and academic conferences of their own fields. Giving oral speeches on academic conferences, whether on or off campus, are highly recommended.

## 2. Innovative Practice (1 credit)

International Graduate Students should take scientific research training and social practices during their training period, which should be carried-out and evaluated by supervisors.

# 6. The Dissertation Related Work

1. Literature Review & Opening Report; 2. Mid-Term Evaluation; 3. Dissertation Writing and Dissertation Pre-Defense (for Ph.D. students); 4. Thesis Defense; 5. Degree Conferment

More Details can be found in *Regulations of Training Procedures for International Graduates of BIT*, *Regulations of Dissertation Pre-Defense for Ph.D. Students of BIT* and *Implementation Regulations on Academic Degree Conferrals of Beijing Institute of Technology*

**Time nodes of relevant procedure**

The Dissertation Related Work	Master	Ph.D.
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Dissertation Pre-Defense	——	Before Review
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference and Lecturer Introduction.

# Energy Economics and Climate Policy

## 能源与气候经济学

(1201J3)

### 1. Overview of the Program

Energy Economics and Climate Policy is an interdisciplinary discipline formed by three primary disciplines: Management Science and Engineering, Applied Economics and Mechanical Engineering. It conducts researches on energy economics, climate policy and environmental management armed with qualitative and quantitative tools, aiming to provide scientific basis for public and private decisions in strategy planning and management that are needed to cope with China's increasing demand for energy as well as the challenges of adapting to and mitigating climate change.

The program has mainly four research areas: Energy, climate and economic development, Energy and climate policy modeling, Energy market and carbon market, new energy and electric vehicle industry policy.

### 2. Training Target

The target is to train high-level innovative talents who have a good knowledge of international common sense, with the ability of spreading Chinese and foreign cultures occupied, so that to bring international graduate students into full play as a cultural bridge. Students should master the solid foundational theories and expertise of energy economics and climate policy discipline, and have the ability to independently engage in scientific research.

### 3. Length of Schooling

The basic length of schooling for master students is 2 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than one year. The maximum length of study for master students is extended by 0.5 years on the basis of 2 years. The basic length of schooling for Ph.D. students is 4 years. In principle, students should complete the courses in the first academic year. Thesis work time should not be less than three years. The maximum length of study for Ph.D. students is extended by 2 years on the basis of 4 years.



#### 4. Curriculum and Credits Requirements

Course Classification	Course Code	Course Name	Course Hours	Credits	Semester	Compulsory/Optional	Master /Ph.D.	Credits Requirement
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Basic Course	2101042	Energy and Environment Nexus: Policy Implications 能源与环境的关系：政策含义	32	2	1/2	Optional	Master /Ph.D.	Master≥2 Ph.D.≥2
Discipline Core Course	2101017	Selective Readings in Energy Economics and Climate Policy 能源与气候经济文献选读	32	2	1/2	Optional	Master /Ph.D.	Master≥2 Ph.D.≥2
Major Optional Course	2101004	Efficiency and productivity analysis of energy and environment 能源环境效率与生产率分析	32	2	1/2	Optional	Master /Ph.D.	Master≥6 Ph.D.≥2
	2101005	Industry green management and optimization 行业绿色管理及优化	32	2	1/2	Optional	Master /Ph.D.	
	2101043	Sustainable Economic Growth and International Energy Situation 可持续经济增长与国际能源形势	32	2	1/2	Optional	Master /Ph.D.	
Total Credits	Master≥24 credits      Ph.D.≥20 credits							

#### Notes:

##### 1. Public Course

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## 3. Discipline Core Course

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**Time nodes of relevant procedure**

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Literature Review& Opening Report	Before week 1 of the 3 <sup>rd</sup> semester	Before week 1 of the 5 <sup>th</sup> semester
Mid-Term Evaluation	——	Before week 1 of the 7 <sup>th</sup> semester
Dissertation Pre-Defense	——	Before Review

<b>The Dissertation Related Work</b>	<b>Master</b>	<b>Ph.D.</b>
Dissertation Defense	At least 9 months after the Opening Report	At least 18 months after the Opening Report
Degree Application	The application should be raised in a certain time after the Dissertation Defense	

## 7. Course Syllabus

Course Code, Course Name, Class Hour, Credits, Course Description and Course Target, Teaching Method, Evaluation and Exams, Suitable Specialty, Prerequisites, Course Contents, Reference and Lecturer Introduction.

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