



China University of Geosciences, Beijing (CUGB)

中国地质大学（北京）

Training Program for International Doctoral

Student

来华留学博士研究生英文培养方案

China University of Geosciences, Beijing

中国地质大学（北京）

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Basic Regulations of China University of Geosciences, Beijing (CUGB) on the Training of Postgraduate Students Studying in China

中国地质大学（北京）来华留学研究生培养工作基本规定

In accordance with the *Regulations of the Peoples Republic of China on Degree, Interim Measures for the Implementation of the Regulations of the Peoples Republic of China on Degree and Trial Measures for the Award of Chinese Degree by Ordinary Institutions of Higher Learning to International Student in China* and the spirit of the relevant documents issued by the Academic Degree Committee of the State Council and the Ministry of Education, combined with the specific circumstances of our school, this regulation is formulated.

根据《中华人民共和国学位条例》《中华人民共和国学位条例暂行实施办法》和《关于普通高等学校授予来华留学生我国学位试行办法》以及国务院学位委员会、国家教育部的有关文件精神，结合我校具体情况，制定本规定。

These regulations apply to academic postgraduate student studying in China, and their educational system and length of study shall comply with the *China University of Geosciences (Beijing) International Students Status Management Regulations*. Each discipline shall formulate training programs for postgraduate student studying in China in accordance with these regulations.

本规定适用于学术型来华留学研究生，其学制与学习年限执行《中国地质大学（北京）来华留学生学籍管理办法》（中地大京国际发〔2021〕8号）。各学科根据本规定制定来华留学研究生培养方案。

一、Training Objectives

培养目标

1. Understand Chinese culture and basic national conditions, adhere to a friendly political stance towards the country, respect Chinese social moral and custom, abide by law and regulations, have good conduct, be honest and trustworthy, have good physical and mental health, and good scientific research ethic and professionalism.

了解中国文化和基本国情，坚持对我国友好的政治立场，尊重中国的社会公德和风俗习惯，遵纪守法，品行端正，诚实守信，身心健康，具有良好的科研道德和敬业精神。

2. To meet the needs of scientific and technological progress and social development, master solid basic theories and systematic expertise in this discipline, have a wide range of knowledge and strong self-learning ability, and also the ability to engage in scientific research

or independently undertake specialized technical work. Chinese proficiency requires a preliminary ability to use Chinese language everyday and read Chinese materials for the major.

适应科技进步和社会发展需要，在本学科上掌握坚实的基础理论和系统的专门知识，有较宽的知识面和较强的自学能力，具有从事科学研究或独立担负专门技术工作的能力。汉语水平要求具有使用生活用语和阅读本专业汉语资料的初步能力。

3. Have innovative spirit, creativity and entrepreneurial quality.

具有创新精神、创造能力和创业素质。

According to the above-mentioned three requirements and the first-class discipline standard, each discipline, combined with its own development characteristic and the reality of postgraduate student studying in China, defines the training orientation of postgraduate student studying in China, and formulates training objective with the characteristic of discipline.

各学科根据上述三点要求及一流学科标准，结合自身发展特色和来华留学研究生的实际，明确来华留学研究生的培养定位，制定有本学科特色的培养目标。

二、Training Direction

培养方向

The training direction should be set according to the characteristics of the discipline and the trend of the development of science and technology in this field, and should be scientific, standardized and relatively stable. We should pay close attention to the fields of great or far-reaching significance in economic, scientific and technological, and social development, so that the training of graduate students studying in China is based on the frontier of discipline development in China. Encourage the establishment of training direction in emerging interdisciplinary programs and set up training direction in the research fields required by national and social development that overseas postgraduate originally comes from.

培养方向设置要依据本学科的特点和本领域科技发展的趋势，要科学规范，相对稳定；要密切关注经济、科技、社会发展具有重大或深远意义的领域，使来华留学研究生的培养立足于我国的学科发展前沿。鼓励在新兴交叉学科设置培养方向，鼓励在来华留学研究生所在国家和社会发展需要的研究领域设置培养方向。

三、Enrollment, Admission and Student Status Management

招生、录取及学籍管理

The recruitment and admission of overseas postgraduate student studying in China and relevant management of student on campus shall implement *China University of Geosciences (Beijing) Management Measures for Recruitment and Training of International Student*.

来华留学研究生的招收、录取及在校生的相关管理具体执行《中国地质大学（北京

）留学生招收和培养管理办法》(中地大京发〔2019〕72号)。

The majors that our university recruits for postgraduate student studying in China are subject to the majors announced to the public in the current year. The admission time is September each year, the admission time for special scholarship student can be arranged according to the actual situation. The postgraduate entrance examination for studying in China will be conducted by means of pre-enrollment qualification review and an interview with the instructor (hereinafter referred to as the instructor) in the first week after enrollment. The arrangement of tutors for postgraduate student studying in China is generally determined by the International Cooperation and Exchange Office and the relevant training school based on the application materials.

我校招收来华留学研究生的专业以当年度对外发布的专业为准。入学时间为每年的九月，专项奖学金生可根据实际情况安排入学时间。来华留学研究生入学考试采取入学前资格审查和入学后第一周指导教师（以下简称导师）面试的方式进行。来华留学研究生导师的安排一般根据学生的申请材料，由国际合作与交流处以及相关培养学院商定后确定。

Management of student status for postgraduate student studying in China, including admission of new student (enrollment education), foreign affairs procedure, registration and payment, discipline and attendance, suspension and resumption of study, transfer of school and major, leave, withdrawal, rewards and punishments, graduation and completion, etc. are all according to *China University of Geosciences (Beijing) International Students Status Management Regulations*, among them, for the management of scholarships for the postgraduate studying in China, please refer to *China University of Geosciences (Beijing) Beijing Foreign Student Scholarship Application Method*.

来华留学研究生的学籍管理，包括新生入学（入学教育）、外事手续、注册与缴费、纪律与考勤、休学与复学、转学与转专业、请假、退学、奖励与处分、毕业与结业等，执行《中国地质大学（北京）来华留学生学籍管理办法》（中地大京国际发〔2021〕8号），其中来华留学研究生的奖学金管理，具体参照《中国地质大学（北京）北京市外国留学生奖学金申请办法》（中地大京国际发〔2021〕12号）。

四、Training Mode and Study Period

学习年限与培养方式

China University of Geosciences, Beijing has a 3-year study period for postgraduate study in China, and the maximum study period is 4 years. In principle, postgraduate study in China will not be extended. Doctoral student studying in the University of Geosciences (Beijing) generally has a study period of 4 years. Those who have studied for 4 years need to apply for an extension of the study period, and the maximum study period is 6 years.

中国地质大学（北京）来华留学硕士研究生学制为3年，学习年限最长为4年，原则上，来华留学硕士研究生不予延期。

中国地质大学（北京）来华留学博士研究生学习年限一般为4年，学习满4年者，需要申请延长学习年限，最长学习年限为6年。

In principle, the cumulative time of postgraduate students studying in China for course study and scientific research work at CUGB shall not be less than half of the overall study period.

来华留学研究生在我校进行课程学习和科学研究工作的时间原则上累计不得少于整体学习年限的一半。

For doctoral student studying in China, there are generally no Master-Doctor successive programs. The overall length of study for joint education programs and dual-degree programs should also meet the above-mentioned requirements.

对来华留学博士研究生一般不设置硕博连读项目及硕士转博士项目。联合培养项目、双学位培养项目的总体学习年限同样应满足上述学习年限要求。

Chinese and/or English are the language of training for graduate students studying in China. The training of graduate students whose language is Chinese shall be carried out according to the academic postgraduate training program of our university. The dissertation may be completed in English, but a Chinese abstract should be written. The language of dissertation defense may be Chinese or English. The approval materials and resolutions of the defense must be written in Chinese and archived, and English copies may be attached.

来华留学研究生的培养语言为中文和/或英文。培养语言为中文的来华留学研究生参照我校当年学术型研究生培养方案执行。学位论文可用英文完成，但应撰写中文摘要。学位论文答辩语言可使用中文或英文；答辩审批材料及决议等必须用中文书写并存档，可附有英文副本。

No changing in major or tutor is permitted after three months since the registration unless there is a special reason.

来华留学硕士研究生入学三个月之后，如无特殊原因，不可更换专业、不可更换导师。

The credit system is applied to postgraduates studying in China, which includes course study, practice and degree thesis. The tutor shall bear the responsibility for training of international postgraduates. The tutor (group) should be responsible for making the training plan of international students, guidance of their thesis proposals, scientific research and their thesis writing. It is encouraged to establish the university-enterprise joint training model, and for qualified inter disciplines and co-constructed disciplines, a guidance group headed by tutors can be established.

来华留学研究生实行学分制，采取课程学习、实践训练和学位论文相结合的培养方式，实行责任导师负责制，或以导师为主的指导小组制。导师（组）负责制定来华留学

硕士研究生个人培养计划、组织开题报告、指导科学研究和学位论文等。鼓励有条件的培养单位建立校所、校企联合培养模式、以及交叉学科、共建学科实施导师组的指导模式。

五、Training Program

培养方案的制定

(一) Formulation and Modification of Training Program for International Postgraduate Students

来华留学研究生培养方案的制定及修订

Academic Degree Assessment Committee is responsible for formulating and modifying the training programs of each discipline. The training program of international postgraduates refers to *Primary Requirements for Master Degrees of First-Level Disciplines* issued by Discipline Evaluation Group of Academic Degrees Committee of the State Council. The training program of international Ph.D. students refers to *Primary Requirements for Doctoral Degrees of First-Level Disciplines* issued by Discipline Evaluation Group of Academic Degrees Committee of the State Council and *Basic Requirements for Professional Doctoral Degree* compiled by the National Professional Degree Graduate Education Steering Committee. It will be modified properly according to the development of national and university education, the demand of training talents, and the reality of international students.

学位评定分委员会负责组织制定及修订各学科研究生培养方案。来华留学硕士研究生的培养方案参照国务院学位委员会学科评议组编制的《一级学科硕士学位基本要求》制定；来华留学博士研究生的培养方案，应根据不同学位类型，分别参照国务院学位委员会学科评议组编制的《一级学科博士学位基本要求》制定，并根据国家及学校研究生教育的发展及人才培养工作的需要，结合留学生的实际情况，适时修订。

(二) Formulation of Personal Training Plan of International Postgraduate Students

来华留学研究生个人培养计划的制定

The personal training plan of international postgraduate students shall be based on the training program of the discipline first, and then it will be specified by the tutor (group) and the student himself together. The personal training plan should be individualized and on-demand, considering the knowledge structure of international postgraduate students and the demand of thesis. The plan include course study plan, practice plan, and research plan of thesis. The course study plan and practice plan shall be made within two weeks after the entrance, while the research plan of thesis can be discussed in detail in thesis proposals. Once the personal training plan is made, it shall not be changed.

根据本学科的培养方案，由导师（组）与来华留学硕士研究生本人共同制定来华留学硕士研究生个人培养计划。个人培养计划应在考虑来华留学硕士研究生知识能力结构

与学位论文要求的基础上，充分体现个性化及按需定制的原则。个人培养计划包括课程学习计划、实践训练计划和学位论文研究计划。课程学习计划及实践训练计划应在留学研究生入学后2周内制定，学位论文研究计划应在开题报告中详细描述。个人培养计划制定确认后，不得随意变更。

(三) Requirements of Knowledge Structure and Credits

培养方案的主要内容

Each school must design its course programs adapting to the course system of postgraduate students at China University of Geosciences, Beijing, considering background of international students from different countries and special requirements of students from different scholarship programs, so that to improve the training of students in their primary knowledge and practical abilities.

培养学院在课程体系设计上，应与我校研究生课程体系相适应，同时兼顾来自不同国家的留学生的背景、考虑不同专项奖学金生的特殊需求，加强对留学研究生基础知识的传授以及实践能力的培养。

The training program of international postgraduate students is consist of common degree programs, compulsory major courses, theoretical courses and comprehensive practice. Please refer to Table 1 for the lowest credits requirements for international postgraduate students. Among them, common degree programs and professional degree courses belong to degree courses, including Chinese language, general conditions of China, scientific ethics and writing, and professional courses, which must be completed.

来华留学硕士研究生培养环节的课程设置包含公共学位课、专业学位课、专业选修课及实践环节四大模块，表1 为来华留学硕士研究生的培养方案课程设置。其中公共学位课和专业学位课属于学位课程，包括汉语、中国概况、科技道德与写作以及专业类课程，必须完成。选修课程中除了标注必修的外，可以任选。

Comprehensive practice is one of the most important methods to improve the teaching and scientific research ability of postgraduates and test the learning effect of postgraduates. Master students can participate in scientific research practice, teaching practice, management practice, social practice or other types of practical activities, requiring 2 credits.

实践环节是提高研究生的教学、科研能力，检验研究生学习效果的重要手段之一。硕士研究生可参加科研实践、教学实践、管理实践、社会实践或其他类别的实践活动，要求达到2个学分。

Table 1 Knowledge Structure and Credits Requirements for International Research Master Degree Students

表 1 来华留学生英文培养方案课程设置-硕士

Courses Types 课程类别	Courses Numbers 课程编号	Courses names 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Lecture Departments 开课单位	Remarks 备注
Common Degree Programs 公共学位课	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	—	
	X21504003	General Conditions of China 中国概况	32	2		—	
	X21504004	HSK level 3 HSK三级	16	1		—	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1		—	
Compulsory Major Courses 专业学位课	X21504006	Review of Scientific Literature 科技文献综述	48	3			
	X21301001	Progress in Earth Science 地球科学进展	32	2			
Major Optional Course 专业选修课							≥2 credits 不少于2学分
							≥6 credits 不少于6学分
	X21314001	Taijiquan(24-forms) 24式简化太极拳	16	1		Department of P. E. 体育部	
Compulsory Parts 必修环节	Professional Practice 专业实践			2			
	Thesis Opening Report 论文开题报告			—			
	Interim Report 论文中期报告			—			
	Academic report delivery 作学术报告			—			

Remarks: Common Degree Programs are offered by International Cooperation and Exchange Office.

备注：公共学位课由国际合作与交流处统一开设。

The training program of international doctoral students is consist of common degree programs, compulsory major courses, theoretical courses and comprehensive practice. Please refer to Table 2 for the lowest credits requirements for international doctoral students. Among them, common degree programs and professional degree courses belong to degree courses, including Chinese language, general conditions of China, scientific ethics and writing, and professional courses, which must be completed. Doctoral students are encouraged to take non-specialized courses outside the degree program, and the credits earned will be listed on the transcript.

来华留学博士生的课程设置分为公共学位课和选修课两部分，表 2 为来华留学博士研究生培养方案课程设置，其中公共学位课和专业学位课属于学位课程，包括汉语、中国概况、科技道德与写作以及专业类课程，必须完成。选修课程中除了标注必修的外，可以任选。鼓励博士生在学位课之外选修非本专业课程，所得学分列入成绩单。

Table 2 Knowledge Structure and Credits Requirements for International Doctoral Students

表 2 来华留学生英文培养方案课程设置-博士

Courses Types 课程类别	Courses Numbers 课程编号	Courses names 课程名称	Periods 学时	Credits学 分	Semesters 开课学期	Lecture Departments 开课单位	Remarks 备注
Common Degree Programs 公共 学位课	X21504001	Chinese Language 汉语	80	5	Autumn	——	
	X21504003	General Conditions of China 中国概况	32	2		——	
	X21504004	HSK level 3 HSK三级	16	1		——	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1		——	
Compulsory Major Courses 专业 学位课	X21504006	Review of Scientific Literature 科技文献综述	48	3			
	X21301001	Progress in Earth Science 地球科学进展	48	3			
Major Optional Courses							≥2 credits 不少于 2学分

Courses Types 课程类别	Courses Numbers 课程编号	Courses names 课程名称	Periods 学时	Credits学 分	Semesters 开课学期	Lecture Departments 开课单位	Remarks 备注
专业 选修课	X21314001	Taijiquan(24-forms) 24式简化太极拳	16	1		Department of P. E. 体育部	
Compulsory Parts 必修环节	Thesis Opening Report 论文开题报告			—			
	Interim Report 论文中期报告			—			
	Academic report delivery 作学术报告			—			
	Pre-oral defense 预答辩			—			

Remarks: Common Degree Programs are offered by International Cooperation and Exchange Office.

备注：公共学位课由国际合作与交流处统一开设。

For international postgraduate students whose master major is not matching with undergraduate major, they can choose two to three undergraduate courses as selective courses under the guidance of the tutor (group). The credits of these courses will be calculated as half of the original course credits, which is not included into the total credits of Master Degree.

对缺少本学科本科层次专业基础的跨学科培养的来华留学研究生，可在导师（组）指导下，将 2-3 门本学科的本科核心课程作为留学硕士生选修课，所修课程学分按原课程学分的 1/2 计，且不计入硕士学位的总学分要求。

For international postgraduate students who are from special scholarship, double-degree and joint-training programs, please refer to relevant agreements on the basis of fulfilling the requirements above.

专项奖学金生、双学位、联合培养等项目的来华留学硕士研究生的课程学习要求在完成上述要求的基础上见相关协议。

六、The Setting of Training Steps

培养环节设置要求

The credit system is applied to international postgraduate students, which requires them to fulfill total credits and subtotal credits required for each part in the knowledge structure of training program, before they apply for thesis defense. To this end, they shall refer to their training plans and the advice from their tutor (group).

来华留学硕士研究生实行学分制，要求来华留学硕士研究生依据培养方案，参照导师（组）建议，于申请学位论文答辩前满足学科培养方案的知识能力结构中所规定的各

部分学分及总学分要求。

(一) Theoretical Courses and Credits Requirements

学位理论课及学分要求

Curriculum for international postgraduates consists of academic literacy courses, basic disciplinary courses, major courses, interdisciplinary courses, and so on. The curriculum of postgraduate students and Ph.D. students is interconnected, and in general each credit corresponds to 16 credit hours.

来华留学硕士研究生理论课程体系包括表 1 中的公共学位课、专业学位课、专业选修课等。研究生课程设置采取硕博打通模式，一般每学分对应 16 课内学时。

1. Academic Literacy Courses

公共学位课

This group of courses is designed for the cultivation goal of basic academic ability, science and technology and academic ethics, including scientific research method, Chinese language proficiency, scientific writing and reporting, science and technology ethics and academic ethics, etc. Language and cultural courses are compulsory courses for the degree, organized by the International Cooperation and Exchange Office, and should be completed in the first academic year, including:

本组课程针对“具备基本学术能力、科技及学术道德伦理”的培养目标而设。包括汉语、中国概况、科技道德与写作等方面的课程。公共学位课由国际合作与交流处组织开设，理论上在第一学年完成，包括：

❖ Chinese Language	8 Credits	汉语	8 学分
❖ General Conditions of China	2 Credits	中国概况	2 学分
❖ HSK level 3	1 Credit	HSK 三级	1 学分
❖ Scientific Ethics and Writing	1 Credit	科技道德与写作	1 学分

Chinese-Level 1 (2 credits), Chinese-Level 2 (1 credit) and Introduction to China (1 credit)

In addition, the credit requirements of this course group in the training program of each discipline can be set on the basis of the minimum required credits specified in Table 1. For more information about course study and score management of international postgraduates, please refer to *the Rules of the International School of China University of Geosciences, Beijing on Course Study Management for International Postgraduates*.

此外，各学科培养方案中本课程组的学分要求，可在表 1 规定的最低必修学分基础上按需设置。来华留学硕士研究生的课程学习与成绩管理，具体见《中国地质大学（北京）来华留学生学业考核及成绩管理细则（修订稿）》（中地大京国际发〔2021〕11号）

International postgraduates entitled to special scholarship, dual degree and joint training program shall complete all said requirements on course study as well as other requirements set in relevant agreements.

专项奖学金生、双学位、联合培养等项目的来华留学硕士研究生的课程学习要求在完成上述要求的基础上见相关协议。

2. Basic Disciplinary Courses & Major Courses

专业学位课

The group of courses is designed for the cultivation goal of mastering solid, broad, systematic and in-depth specialized knowledge of the basic theory of the discipline and being familiar with the development of the frontier of the discipline. All disciplines are required to clearly set the core curriculum and course selection requirements in the training program. In addition to core courses, the credit requirements of course groups in the training programs of each discipline can be set on the basis of the minimum required credits specified in Table 1.

本组课程针对“掌握坚实宽广的学科基础理论、系统深入的专门知识以及熟悉学科前沿发展”的培养目标而设。要求各学科在培养方案的本组别中，明确设定核心课程及选课要求。除核心课程外，各学科培养方案中课程组的学分要求，可在表 1 规定的最低必修学分基础上按需设置。

At least three credits of mathematics courses should be completed for international postgraduate students. Mathematics courses are compulsory courses for the degree and will be organized by the International Cooperation and Exchange Office of China University of Geosciences, Beijing. They should be completed in the first academic year.

来华留学硕士研究生至少科技文献综述以及地球科学进展等课程，应在第一学年完成。

- | | | | |
|---|---|--------|-----|
| ✧ | Review of Scientific Literature 3 Credits | 科技文献综述 | 3学分 |
| ✧ | Progress in Earth Science 3 Credits | 地球科学进展 | 3学分 |

3. Interdisciplinary Courses

专业选修课

Interdisciplinary courses are offered by the other training schools and the International School.

其它培养学院以及国际学院开设的课程均可作为跨学科课。

(二) Comprehensive Practice 实践环节

1. Professional Practice (organized as appropriate by the training school)

专业实践（由培养学院视情况选择实施）（硕士）

Professional practice aims to cultivate the practical ability and innovative consciousness of postgraduate students, which involves diversified practical activities to improve the application ability of theoretical knowledge. The school shall formulate assessment standards, and tutor will take charge of the assessment, as well as record scores.

专业实践以培养研究生实践能力和创新意识为目的，开展多元化实践活动，提高理论知识的运用能力。由学院制定考核标准，指导教师负责考核，记载成绩。

2. Academic Activities

做学术报告

The academic activities required for the credits is to select and listen to academic presentations hosted by the graduate school and the training school.

学分规定的学术报告环节是指选听由研究生院及学院邀请的学术报告。

It is required that the total number of academic presentations selected by international postgraduate students shall not less than eight times, and the sponsor will record the attendance.

硕士研究生在学期间要求参加8次以上学术活动，由院（部）负责考核。学术活动及其考核在研究生学位论文答辩前完成。

Doctoral students shall participate in more than 10 academic activities during their studies, and make at least one academic report in the school (department) or the university. Before dissertation defense, academic papers must be published in academic journals. For specific requirements, please refer to *Regulations of China University of Geosciences, Beijing on Scientific Research Achievements for Graduate Students Applying for Degrees*. In addition, doctoral students should also participate in teaching practice and social practice activities.

博士生在学期间应参加10次以上的学术活动，并在院（部）或全校范围内至少作一次学术报告。在学位论文答辩之前，须在学术刊物上公开发表学术论文，具体要求详见《中国地质大学（北京）关于研究生申请学位时科研成果的规定》（中地大京发〔2018〕4号）。此外，博士生还应参加教学实践和社会实践活动。

七、Degree Thesis and Relevant Works

学位论文及相关工作

The conduction of master's degree thesis is a comprehensive training process in which master students participate in systematic scientific research under the guidance of their supervisor (group), and acquire the ability to combine theory with practice, innovate thinking ability and carry out scientific research work ability. During this process, the supervisor should adhere to the moral of teaching tirelessly; Master students should carry forward the spirit of innovation and perseverance.

硕士学位论文工作的开展，是硕士研究生在导师（组）指导下，参与完成系统的科

学研究，获得理论联系实际能力、创新思维能力及开展科学研究工作能力的综合训练过程。过程中导师要坚持言传身教、诲人不倦的师德；硕士生要发扬勇于创新、坚持不懈的学风。

（一）Thesis Proposals

开题报告

The thesis proposal of international postgraduate students shall be uniformly organized and implemented by the school, and the time from thesis proposal to the application for thesis defense shall be no less than 6 months. Full-time doctoral students are required to complete the thesis proposal no later than the second semester of the third year, and the time from the thesis proposal to the defense of the dissertation application is not less than 10 months.

来华留学研究生开题报告由学院统一组织实施，且开题报告至申请学位论文答辩时间不少于 6个月。要求博士研究生最晚于三年级第二学期完成开题报告，且开题报告至申请学位论文答辩时间不少于10个月。

The detailed rules of the thesis proposal defense shall be implemented in accordance with *the Administrative Regulations of Proposal Defense for Postgraduate Students at China University of Geosciences, Beijing*.

开题答辩细则，遵照《中国地质大学（北京）学位论文开题暂行管理办法》执行。

International postgraduate students are encouraged to choose the topic of thesis in combination with the national conditions of their home country.

提倡留学研究生进行与其本国实际相结合的论文选题。

（二）Thesis Midterm Assessment 学位论文中期检查

The mid-term assessment shall be carried out after completing the course study and obtaining the required credits, generally from the beginning of the third semester to the end of the fourth semester of postgraduate enrollment, combined with literature review and thesis opening report. For detailed information, please refer to the *Implementation Measures for the Mid-term Assessment of Graduate Students of China University of Geosciences, Beijing*.

中期考核工作要在完成课程学习并获得规定学分后进行，一般在研究生入学的第三学期初至第四学期结束前，结合文献综述和开题报告进行。参考《中国地质大学（北京）研究生中期考核实施办法》。

The content of the assessment includes course transcripts, mid-term assessment form with comments from the supervisor and comments of the review team, and mid-term report of the dissertation. After the mid-term assessment is completed, the assessment team will fill in the *Interim Assessment Form* and sign the comments. Those who fail must be reorganized within the specified time. Graduate students who fail the mid-term assessment for two consecutive times will be dismissed from study.

考核内容包括课程学习成绩单、含导师评语和评议组意见的中期考核表、学位论文中期报告。中期考核完成后，由考核小组填写《中期考核表》并签署意见，未通过者须在规定时间内重新组织。连续两次未通过中期考核的研究生，取消学习资格。

（三）Extension 延期申请

In general, international postgraduate students are not allowed to extend their study period. Those who need to extend their study period due to special reasons such as suspension of schooling or government-funded overseas study, should go through relevant examination and approval procedures.

来华留学研究生一般不允许延长学习年限，因休学等特殊原因需要延长者，应按相关审批流程办理。

（四）Thesis Review and Defense

学位论文评阅与答辩

Degree thesis defense includes the fulfillment of the thesis/dissertation qualification approval, academic misconduct literature check, thesis review, and thesis defense qualification approval, degree thesis/dissertation oral defense, etc. Affairs related to the thesis review, defense and degree conferral for international postgraduates are the same as those for Chinese postgraduates and are implemented in accordance with *the Implementation Regulations on Academic Degree Conferrals of China University of Geosciences, Beijing*, and should meet the requirements of each training school.

学位论文评阅与答辩，包括完成学位论文资格审查、学术不端文献检测、学位论文评阅、学位论文答辩审批、学位论文口头答辩等环节。具体执行《中国地质大学（北京）学位授予工作实施细则》，并满足各培养单位具体要求。

At least 2 weeks are offered for the international Master's Degree candidates.

来华留学硕士研究生应至少留有两周的答辩时间。

For International postgraduates under joint programs, one expert can be invited from overseas cooperation unit.

对联合培养的来华留学研究生，其他单位的专家可来自境外合作单位（仅限1名）。

Graduation certificate shall be issued by the International Cooperation and Exchange Office after the international postgraduate student passes the degree thesis defense. Degree certificate shall be issued to international postgraduates after the approval of both Academic Degree Evaluation Sub-Committee at School-Level and Academic Degree Evaluation Committee.

来华留学研究生完成毕业（学位）论文答辩并通过者，准予毕业，由国际合作与交流处颁发毕业证书。准予毕业的留学生，经培养学院分学位委员会和我校学位委员会审查符合授予学位条件者，颁发学位证书。

Based on the recommendations of the training schools, Graduate School shall evaluate Excellent Master's Degree Thesis in proportion to international postgraduates applying for Master's Degree conferral every two year.

研究生院根据培养学院推荐意见，对每年度申请授予硕士学位的留学研究生按一定比例评选优秀硕士学位论文。

(五) Publication of Academic Papers

发表论文要求

International postgraduate students are encouraged to publish academic papers in combination with their research work

鼓励来华留学硕士研究生在学期间结合科研工作有学术论文发表。

八、Termination of Study

终止培养

An international postgraduate will be terminated from the training program if any of the following cases occurs:

在培养过程中，有下列情况之一者，终止培养：

1. The student who has a bad performance of morality and academic ethics;

因思想品德及学术道德问题，不宜继续培养者；

2. The student who is disqualified to apply for a degree because of duplicate checking of thesis;

因学位论文查重被取消学位申请资格者；

3. The student fails in the entrance language examination and still fails after one semester's academic probation;

入学语言测试不合格，试读一学期仍未达到要求者；

4. The student fails to pass the report of thesis proposal twice;

开题报告两次均不通过者；

5. The student fails to pass in-process inspection of thesis;

没有通过中期检查者；

6. The student has not been approved when application for study period extension or has not applied for extension when his study period overdue;

学习年限逾期未申请延期、或延期申请未获批准者；

7. The student applies for the termination of study at China University of Geosciences, Beijing with the agreement of the supervisor and the training school;

由研究生本人提出终止学习要求且经责任导师同意、所在学院批准者；

8. The student's termination is proposed by the supervisor and the training school;

由责任导师提出终止培养并经所在学院批准者；

9. Others.

由于其他原因不宜继续培养者。

Those who are terminated from the training program shall be conferred the Certificate of Successful Completion of the Courses if they have finished all courses' study and meet the requirements of the training program. For those who fail to complete all courses' study, only a certificate for the courses study is conferred.

终止培养者，如课程全部结束且符合培养方案要求，可发课程结业证书；如未完成课程学习，只提供所学课程的学习证明。

The regulations apply to the international postgraduates enrolled in or after 2021.

本规定适用于2021年（含）以后入学的英文授课学术型来华留学研究生。

The right to interpret the regulations belongs to the Graduate School and the International Cooperation and Exchange Office. If the requirement of discipline training program is higher than these regulations, it shall be carried out according to high standards.

本规定解释权归国际合作与交流处。若学科培养方案要求高于本规定，按高标准执行。

(0202) Applied Economics Training Program for International Doctoral Student

(0202) 应用经济学 博士留学生 培养方案

一、Training Goal 培养目标

The cultivation of doctoral students in this discipline emphasizes the all-round development of morality, intelligence and physique, requiring students to abide by discipline and law, conduct well, have the ideology of serving the people and the spirit of pursuing truth, and strive to become senior professionals with high quality, good knowledge structure, independent research ability and strong innovation. The doctoral degree holders of this discipline should reach the following training levels: 1. They should possess excellent political morality, academic ethics, patriotism, the ideology of serving the people and high scientific morality. 2. They should possess a solid and broad theoretical foundation, systematic professional knowledge and rigorous thinking ability, be able to know the frontier trends of Applied Economics from various documents and be able to carry out research and achieve innovative research results based on major strategic needs of national economic development. 3. They should master scientific methodology, be good at thinking and be brave in innovation. They should also possess the ability to engage in scientific research independently. Specifically, they need to carry out investigation, scheme design, model creation, data analysis, empirical test, etc. in the field of this discipline independently. The ability to continue learning, innovation and improvement is also required. 4. They should be proficient in a foreign language and have strong international academic communication skills. 5. They should be competent in scientific research and teaching of Economics and related majors after graduation.

本学科博士生的培养强调德、智、体全面发展，遵纪守法，品行端正，具有为人民服务的思想和追求真理的精神，努力成为具有较高素质、良好知识结构、独立从事研究工作和较强创新能力的高级专门人才。本学科博士学位获得者应达到如下培养水平：1、具备优良的政治思想品德和学术道德，具有爱国主义以及为人民服务思想和高尚科学道德。2、具有坚实宽广的理论基础、系统的专业知识和严谨缜密的思维能力，能够从各种文献获取应用经济学前沿动态，能够对接国家经济发展重大战略需求，开展研究并取得创新性研究成果。3、掌握科学的方法论，善于思考，勇于创新。具有独立从事科学研究工作能力，能够独立开展本学科领域调查研究、方案设计、模型创建、数据分析、实证检验等，具有继续学习、创新、提高的能力。4、熟练掌握一门外语，具有较强国际学术交流能力。5、毕业后胜任经济学及相关专业科学研究和教学工作。

二、Research Directions 研究方向

Research Direction 研究方向	Research Content 研究内容
<p>1.Regional economics 区域经济学</p>	<p>This direction takes regional economic activities as the main research object, and mainly applies relevant theories and research methods of regional economics to carry out regional economic theories and policies, regional coordinated development, new urbanization and urban-rural integration, rural revitalization, regional division of labor and trade, regional mining development and so on. 该方向以区域经济活动为主要研究对象，主要运用区域经济学的相关理论和研究方法开展包括区域经济理论与政策、区域协调发展、新型城镇化与城乡一体化、乡村振兴、区域分工与贸易、区域矿业发展等。</p>
<p>2.International trade 国际贸易学</p>	<p>This direction takes international trade activities as the main research object, and mainly applies relevant theories and research methods of economics to carry out theories and policies of international trade, transfer of implied resources and environment elements in international trade, global value chain and value-added accounting of trade, international trade in mineral resources, and "One Belt and One Road" initiative. 该方向以国际贸易活动为主要研究对象，主要运用经济学的相关理论和研究方法开展包括国际贸易理论与政策、国际贸易隐含资源环境要素转移、全球价值链与贸易增加值核算、矿产资源国际贸易、“一带一路”倡议等。</p>
<p>3.Finance 金融学</p>	<p>This direction takes financial activities as the main research object, and mainly applies relevant theories and research methods of finance to carry out financial engineering and risk management (investment decision optimization, financial risk contagion, financial derivatives), energy finance, climate finance, green finance, mining finance, etc. 该方向以金融活动为主要研究对象，主要运用金融学的相关理论和研究方法开展包括金融工程与风险管理（投资决策优化、金融风险传染、金融衍生品）、能源金融、气候金融、绿色金融、矿业金融等。</p>

三、Study Period and Credit Requirement 学习年限与学分要求

The length of study for doctoral students in China is generally 4 years, the maximum of study period is 6 years, and the credits should be no less than 21. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for postgraduate students and Ph.D. students are interconnected, and in general each credit is equivalent to 16 class hours.

来华留学博士研究生学制 4 年，最长学习年限 6 年，不少于 21 学分。课程设置包括公共学位课、专业必修课、专业选修课及必修环节。研究生课程采取硕博打通模式，一般每学分对应 16 课内学时。

四、Curriculum Settings 课程设置

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
Public Courses 公共学位课	X21504001	Chinese Language 汉语	80	5	Autumn	——	
	X21504003	General Introduction of China 中国概况	32	2		——	
	X21504004	HSK level 3 HSK 三级	16	1		——	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1		——	
Compulsory Courses 专业学位课	X21504006	Review of Scientific Literature 科技文献综述	48	3			
	X21301001	Progress in Earth Science 地球科学进展	48	3			
	X21307007	Resource and Environmental Economics 资源环境经济	32	2		School of Economics and Management 经济管理学院	
	X21307006	Research Methods of Data and Model 数据模型与方法	32	2		School of Economics and Management 经济管理学院	
Optional Courses 专业选修课	X21307008	Resource and Environmental Management 资源环境管理	32	2		School of Economics and Management 经济管理学院	≥2 credits 不少于2学分
	X21307005	Mining Finance 矿业金融	16	1		School of Economics and Management 经济管理学院	
	X21307004	International Finance Management 国际金融管理	32	2		School of Economics and Management 经济管理学院	

	X21314001	Taijiquan(24-forms) 24 式简化太极拳	16	1		Department of P. E. 体育部	
Compulsory Parts 必修环节	Basic Practice of Chinese 汉语基础实践			1	Autumn	——	
	Chinese Professional application 汉语专业应用			2	Summer	——	
	Thesis Opening Report 论文开题报告			——			
	Interim Report 论文中期报告			——			
	Academic report delivery 作学 术报告			——			
	Pre-oral defense 预答辩			——			

Remarks: Public Courses are offered by International Cooperation and Exchange Office.

备注：公共学位课、必修环节中 Basic Practice of Chinese 汉语基础实践、Chinese Professional application 汉语专业应用由国际合作与交流处统一开设。

五、Catalogue of Classic Works and Professional Academic Journals for Reading 推荐阅读经典著作和专业学术期刊目录

- [1] American Economic Review
- [2] Econometrica
- [3] Journal of Political Economy
- [4] Quarterly Journal of Economics
- [5] Energy Economics
- [6] Energy Policy
- [7] Journal of Economic Perspectives
- [8] Review of Environmental Economics and Policy
- [9] Journal of the Association of Environmental and Resource Economists
- [10] Review of Economic Studies
- [11] Journal of Economic Growth
- [12] Ecological Economics
- [13] Applied Energy
- [14] Resources Policy
- [15] Regional Studies
- [16] Economics of Energy & Environmental Policy
- [17] Applied Economic Perspectives and Policy
- [18] Journal of Finance
- [19] Brookings Papers on Economic Activity
- [20] Journal of Financial Economics
- [21] Environmental and Natural Resource Economics, Jonathan M. Harris, Houghton Mifflin Company 2006.

(0708) Geophysics Training Program for International Doctoral Student

(0708) 地球物理学 博士留学生 培养方案

一、Training Goal 培养目标

Respect the Chinese culture and the basic national condition, obey the Chinese social morality, customs and habits, possess the realistic scientific spirits, qualified academic morality and the innovative spirits; possess a solid foundation of theories and a systematic professional knowledge, understand the trends of development and the academic frontiers of Geophysics, master the skills and methods of scientific research, have the ability to carry on the scientific research independently; could apply the specific theories and methods to solve the frontier scientific issues and technical problems, produce the innovative achievements, undertake the teaching, research, and management independently in the domains of deep earth, deep sea, deep space, resources, environment, and engineering.

尊重中国文化和基本国情，遵从中国社会公德和风俗习惯，具备求实的科学作风、良好的学术道德和勇于创新的精神；具有较扎实的理论基础和系统的专业知识，了解地球物理学领域的发展趋势和学术前沿，掌握科学研究的技能和方法，具有独立开展科学研究的能力；能够运用本学科理论和方法解决地球物理领域的前沿科学问题和技术难题，做出创新性成果，在深地、深海、深空以及资源、环境、工程等领域独立承担地球物理学的教学、科研和管理等工作。

二、Research Directions 研究方向

Research Direction 研究方向	Research Content 研究内容
1.Deep Geophysics 深部地球物理	Utilize different geophysical methods including gravity, magnetic, electromagnetic, and seismic methods to study the 3D structures of physical properties in the deep crust and mantle, investigate the deep dynamic processes including the plate movement, mantle convection, magmatic action and deep mineralization, and reveal the mechanisms of exchange of materials or energy between the internal spheres of the earth. 该方向主要利用重力、磁法、电法、地震等固体地球物理方法研究地球深部壳幔三维物性结构，探讨板块运动、地幔对流、岩浆活动、深部成矿等深部动力过程以及地球内部各圈层之间物质(或能量)交换的机制。

<p>2. Marine Geophysics 海洋地球物理</p>	<p>Apply the geophysical methods including gravity, magnetic, electromagnetic, radioactive, seismic methods to study the issues based on scientific observation including submarine topography of beach shallow sea and deep shallow sea, submarine geological structures, mineral resources in sea area, seawater thermohaline structure, and the movement of the sea. 该方向主要利用重力、地磁、电磁、放射性、地震等地球物理方法，研究滩浅海、深浅海海底地形、海底地质结构、海域矿产资源、海水温盐结构和海水运动等科学观测研究等领域的问题。</p>
<p>3. Space Physics 空间物理</p>	<p>Through simulation, inversion, and in situ measurements from the spacecrafts to study the space weather caused by the solar eruptive events and to study the intrinsic magnetic field of planets. Investigate the acceleration and propagating mechanisms of solar energetic particles, the composition of coronal mass ejections, multi-layer electromagnetic response during magnetic storms, and internal thermal state and their relation to dynamo magnetic field on Mars and the Moon. 该方向主要利用数值模拟、反演和卫星原位观测分析来研究太阳爆发活动的空间天气效应和行星内禀磁场演化。探究太阳高能粒子加速和传输机制、日冕物质抛射成分特征、磁暴时地球多圈层电磁响应、月球/火星内部热状态与内禀磁场关联等问题。</p>
<p>4. Exploration Geophysics 勘探地球物理</p>	<p>Apply multiple geophysical methods, including gravity, magnetic, electromagnetic, seismic methods to solve the subsurface geophysical problems in gas exploration, mineral resource exploration, geohydrological environment and engineering. To support the mineral deposit and energy resources for sustainable development of economy. 综合应用重力、磁法、电法、地震等方法解决油气勘探、矿产资源探测、水文环境与工程中的浅地表地球物理问题，为经济可持续发展提供矿产和能源完全保障。</p>

三、Study Period and Credit Requirement 学习年限与学分要求

The length of study for doctoral students in China is generally 4 years, the maximum of study period is 6 years, and the credits should be no less than 21. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for postgraduate students and Ph.D. students are interconnected, and in general each credit is equivalent to 16 class hours.

来华留学博士研究生学制4年，最长学习年限6年，不少于21学分。课程设置包括公共学位课、专业必修课、专业选修课及必修环节。研究生课程采取硕博打通模式，一般每学分对应16课内学时。

四、Curriculum Settings 课程设置

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
Public Courses 公共学位课	X21504001	Chinese Language 汉语	80	5	Autumn	—	
	X21504003	General Introduction of China 中国概况	32	2		—	
	X21504004	HSK level 3 HSK 三级	16	1		—	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1		—	
Compulsory Courses 专业学位课	X21504006	Review of Scientific Literature 科技文献综述	48	3			
	X21301001	Progress in Earth Science 地球科学进展	48	3			
Optional Courses 专业选修课	X21310002	Fundamentals of Geophysics 地球物理基础	32	2	Autumn	School of Geophysics and Information Technology 地球物理与信息技术学院	≥2 credits 不少于2学分
	X21310001	Electrical Exploration 电法勘探	32	2	Autumn	School of Geophysics and Information Technology 地球物理与信息技术学院	
	X21310003	Gravity and Magnetic Exploration 重磁勘探	32	2	Autumn	School of Geophysics and Information Technology 地球物理与信息技术学院	

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
	X21310005	Seismic Exploration 地震勘探	32	2	Autumn	School of Geophysics and Information Technology 地球物理 与信息技 术学院	
	X21310004	Rock Physics 岩石物理	32	2	Autumn	School of Geophysics and Information Technology 地球物理 与信息技 术学院	
	X21314001	Taijiquan(24-forms) 24 式简化太极拳	16	1		Department of P. E. 体育部	必选
Compulsory Parts 必修环节	Basic Practice of Chinese 汉语基础实践			1	Autumn	—	
	Chinese Professional application 汉语专业应用			2	Summer	—	
	Thesis Opening Report 论文开题报告			—			
	Interim Report 论文中期报告			—			
	Academic report delivery 作学术 报告			—			
	Pre-oral defense 预答辩			—			

Remarks: Public Courses are offered by International Cooperation and Exchange Office.

备注：公共学位课、必修环节中 Basic Practice of Chinese 汉语基础实践、Chinese Professional application 汉语专业应用由国际合作与交流处统一开设。

五、Catalogue of Classic Works and Professional Academic Journals for Reading 推荐阅读经典著作和专业学术期刊目录

一、Classic Works 经典著作：

1. Stein, S., Wysession, M., An introduction to seismology, earthquakes, and earth structure,

Blackwell Publishing, 2003

2. Masaru, K., Geomagnetism (Treatise on Geophysics, Volume 5), Elsevier, 2009
3. Schrijver, C.G., Siscoe, G.L., Heliophysics, Cambridge University Press, 2010
4. Fiona, S., Karsten, B., Practical Magnetotellurics, Cambridge University Press, 2005
5. Chave, A.D., Jones, A.G., The magnetotelluric method: Theory and practice. Cambridge University Press, 2012.
6. LaFehr T.R., Nabighian M.N., FUNDAMENTALS OF GRAVITY EXPLORATION. Society of Exploration Geophysicists, USA., 2012
7. Kaufman A.A., Hansen R.O., PRINCIPLES OF THE GRAVITATIONAL METHOD. Elsevier, UK., 2008

二、Professional Academic Journals 学术期刊:

1. Earth and Planetary Science Letters
2. Journal of Geophysical Research
3. Geophysical Research Letters
4. Geophysics
5. Tectonophysics
6. Physics of the Earth and Planetary Interiors
7. Geophysical Journal International
8. Geophysical Prospecting
9. Geochemistry, Geophysics, Geosystems
10. Seismological Research Letters
11. Review of Geophysics
12. Surveys in Geophysics
13. Bulletin of the Seismological Society of America
14. Journal Applied Geophysics
15. Pure and Applied Geophysics
16. SCIENCE CHINA Earth Sciences
17. Science Bulletin
18. Earth and Planetary Physics
19. Earthquake Science

(0709) Geology Training Program for International Doctoral Student

(0709)地质学 博士留学生培养方案

一、Training Goal 培养目标

The doctoral degree program of geology is adhered to the mission of training students with good morals, solid foundation, extensive knowledge, and profound professionalism. The program lays emphasis on students' academic ethics and scientific spirit, and cultivates students with substantial academic potential, strong sense of innovation, solid theoretical foundation, good academic communication skills and teamwork vitality. The doctoral program is specially designed to develop students' geological field skills; enhance their understanding of the important theories, core concepts, development history and status of the geology discipline; advance their insights into the discipline; foster their ability of critical thinking and problem solving; and strengthen their teamwork vitality and academic communication skills. The ultimate goal is to prepare students for scientific and technological research and innovative achievements in geosciences.

本学科始终坚持以“品德优良、基础厚实、知识广博、专业精深”为人才培养目标，以恪守学术道德和科学精神，具备较好学术潜力、强烈创新意识、扎实理论基础、良好学术交流能力和团队合作精神为人才培养的重点内容，特别注重培养具备扎实的野外地质工作能力，对于地质学重要理论、核心概念和学科发展历史及现状有透彻了解和把握，对所从事学科具有敏锐的洞察力、准确的判断力和丰富的创造力，善于发现并解决地质学相关领域的科学问题，对该领域有深入研究和独特见解，具备团队合作精神和国际学术交流能力，能够在研究工作过程中取得创新性成果的复合型科技创新拔尖人才。

二、Research Directions 主要研究方向

Research Direction 研究方向	Research Content 研究内容
1.Mineralogy, Petrology, Mineral Deposit Geology 矿物学、岩石学、 矿床学	Taking minerals, rocks, ores, and other earth and planetary materials as the research objects, the theories and research methods of geology and related disciplines are used to carry out research on the structure, composition and evolution of the Earth and other planets. The main research areas include genetic mineralogy and prospecting mineralogy, magmatism and deep processes, sedimentology,

Research Direction 研究方向	Research Content 研究内容
	<p>metamorphic petrology, regional metallogeny, genesis of mineral deposit, etc.</p> <p>Features and advantages: theoretical research on genetic mineralogy and magmatic-hydrothermal evolution are closely integrated with critical metal mineralization, basic geological theory, and mineral resource exploration.</p> <p>该方向以矿物、岩石、矿石等地球和行星物质为研究对象，主要运用地质学和相关学科的理论和研究方法，开展地球结构、物质组成及演化等方面的研究。主要研究领域包括：成因矿物学与找矿矿物学、岩浆作用与深部过程、沉积学、变质岩石学、区域成矿学、矿床成因等。特色与优势：成因矿物学理论研究、岩浆热液演化与战略性金属成矿、基础地质理论与矿产资源勘查密切结合。</p>
<p>2.Geochemistry 地球化学</p>	<p>Taking the Earth and other astronomical objects as the research objects, the theories and research methods of chemistry and physics are used to conduct research on the chemical composition, chemical process, and chemical evolution of related geological units. The main research fields include isotope geochemistry, environmental geochemistry, exploration geochemistry, computational-experimental and fluid geochemistry, etc.</p> <p>Features and advantages: leading the application of stable isotopes of magnesium, iron, zinc, zirconium, and nickel in revealing deep carbon and oxygen cycles and processes. Provide theoretical and experimental guidance for research on diagenesis and mineralization, environmental remediation, and multi-layer interaction of the Earth.</p> <p>该方向以地球（或部分天体）为研究对象，主要运用化学和物理学的相关理论和研究方法开展相关地质体的化学组成、化学作用和化学演化方面的研究。主要研究领域包括：同位素地球化学、环境地球化学、勘查地球化学、计算-实验和流体地球化学等。特色与优势：开拓应用镁、铁、锌、锆、镍金属稳定同位素，揭示深部碳、氧循环及过程。为成岩成矿、环境修复、层圈相互作用等提供理论和实验指导。</p>
<p>3.Paleontology and Stratigraphy (including Paleoanthropology 古生物学与地层学 (含古人类学)</p>	<p>This subject mainly takes paleontology, ancient humans, and strata as the research objects, and applies relevant theories and methods of geobiology and related subjects to carry out studies on the history of earth evolution, the origin and evolution of life on Earth, and the interaction of life and environment. Main research areas include integrative stratigraphy, the rhythm and major geological events of earth evolution, deep-time environment, paleoecology-paleogeography-paleoclimatology, etc.</p> <p>Features and advantages: research in the theory and practice of integrative stratigraphy, earth history, and major geological events.</p> <p>该方向主要以古生物、古人类、地层为研究对象，应用地球生物学及相关学科的相关理论和研究方法，开展地球演化历史、地球</p>

Research Direction 研究方向	Research Content 研究内容
	<p>生命起源与演化、生命和环境相互作用等方面的研究。主要研究领域：综合地层学、地球演化的节律和重大地质事件、深时环境、古生态-古地理-古气候学等。在综合地层学的理论与实践、地球历史和重大地质事件研究方面具有重要特色和优势。</p>
<p>4. Structural Geology 构造地质学</p>	<p>This subject applies the relevant theories and investigations of mathematics, physics, chemistry and geology, and methods of physics and numerical simulation to carry out research on geometry, kinematics, and dynamics of geological structures. Areas of active research include the morphology, formation condition and mechanism, the pattern of distribution and combination, evolution history, geodynamics of different scale structures ranging from microstructures to global structures.</p> <p>Features and advantages: studies of lithosphere-mantle deep process and surface response provide a scientific basis for resource exploration and development, engineering stability evaluation, geological disaster prevention, and geological environmental protection.</p> <p>该方向以地质构造为研究对象，主要运用数学、物理学、化学和地质学相关理论和调查研究、物理与数值模拟等方法开展几何学、运动学和动力学方面的研究，研究内容包括从显微构造到全球构造等各种尺度构造的形态特征、形成条件与机制、分布与组合规律、演化史、地球动力学等。特色与优势：岩石圈-地幔的深部过程与浅表响应研究，为资源探查与开发、工程稳定性评价、地质灾害防治和地质环境保护提供科学依据。</p>
<p>5. Quaternary Geology 第四纪地质学</p>	<p>Research in this field take the Quaternary products as its research object, and use the relevant theories and methods of geology and geography to carry out studies on the Quaternary stratigraphy, paleontology, sedimentology, neotectonics, and paleoclimate, etc. The main research areas include Quaternary environmental evolution, neotectonics and geological disasters, geo-tourism resource evaluation and planning, national park evaluation and planning, etc.</p> <p>Features and advantages: research on Quaternary environmental evolution, geo-tourism resource evaluation and planning, neotectonics and geological disasters, etc.</p> <p>该方向以第四纪时期形成的产物为研究对象，运用地质学、地理学的相关理论和方法，开展第四纪地层、古生物、沉积、新构造、古气候等方面的研究，主要的研究领域包括：第四纪环境演变、新构造运动与地质灾害、地质旅游资源评价与规划、国家公园评价与规划等。特色与优势：第四纪环境演变、地质旅游资源评价与规划、新构造运动与地质灾害等方面的研究。</p>
<p>6. Gemology 宝石学</p>	<p>This field is focused on the studies of gemstones, which mainly uses related theories and methods in gemology and related disciplines to conduct research on the physical and chemical properties of gems,</p>

Research Direction 研究方向	Research Content 研究内容
	<p>genesis and prospecting criteria of mineral deposits, origin traceability, resource development, artificial synthesis and improvement, and quality and process evaluation. The main research fields include gem mineralogy, gem material science, gem mineral deposit geology, gem evaluation and culture.</p> <p>Features and advantages: this subject relies on the theoretical and technical advantages of the subjects of mineralogy, petrology, and mineral deposit geology in the "double first-class" discipline of geology, innovatively develops science and technology in gemology, and serves for the purpose of social economic and cultural construction.</p> <p>该方向为我校自主设置的专业方向。该方向以珠宝玉石为研究对象，主要运用宝石学及相关学科的相关理论和研究方法开展珠宝玉石的物理化学性质，矿床成因和找矿标志，产地溯源，资源开发利用，人工合成与改善和珠宝玉石质量工艺评价等方面的研究。主要研究领域包括：宝石矿物学，宝石材料学，宝石矿床学，珠宝玉石评估与文化。特色与优势：本方向依托地质学“双一流”学科中矿物学、岩石学、矿床学理论与技术优势，创新发展宝石学科学与工艺等方面，服务社会经济与文化建设领域。</p>
<p>7.Hydrogeology 水文地质学</p>	<p>This subject focuses on the study of groundwater (water sphere) science, specifically the origins, formation, evolution of groundwater, and the resource and environment effects in the interaction between groundwater (water sphere) and the mantle, lithosphere, biosphere and atmosphere, so as to provide a scientific basis for the rational development and utilization of groundwater resources and the harmonious development of man and nature.</p> <p>Features and advantages: ecological hydrogeology, environmental hydrogeology, pollution hydrogeology, earthquake hydrogeology, mining hydrogeology, etc.</p> <p>该方向主要研究地下水（圈）的科学，研究地下水的形成与演化规律，以及在地下水（圈）与地幔和岩石圈、生物圈、大气圈相互作用过程中的资源环境效应，进而为合理开发利用地下水资源，实现人与自然和谐发展提供科学依据。特色与优势：生态水文地质、环境水文地质、污染水文地质、地震水文地质、矿区水文地质等方面。</p>
<p>8.Planetary Science and Comparative Planetology 行星地质与比较行星学</p>	<p>Research in this subject focus on the structure, composition, evolution, and genesis of celestial bodies in and outside the solar system, as well as the interaction between planets in the solar system. The main research objectives include geological activities and processes, composition, structure, and evolution of celestial bodies in the solar system, impact structure on planetary surface, geochemical characteristics of various meteorites, surface and internal structure of asteroids and comets, etc.</p>

Research Direction 研究方向	Research Content 研究内容
	<p>Features and advantages: research on the geological evolution of the moon.</p> <p>该方向是研究太阳系及太阳系外各类天体结构、成分和演化与成因以及太阳系行星间相互作用的科学。主要内容包括：太阳系天体地质活动和过程、成分与结构和演化、行星表面撞击构造特征、各类陨石的地球化学特征分析、小行星和彗星的表面和内部结构特征等。特色和优势：月球地质演化研究。</p>
9.Geobiology 地球生物学	<p>This subject focuses on the study of epigenetic earth system, and mainly uses the related theories and methods of geology and biology to carry out research on the interaction between the biosphere and other spheres of the Earth. The main research areas include the succession of biological communities and the evolution of the earth's environment, biogeochemistry and global change, mineral-microbe interactions, and microbes in extreme environment.</p> <p>Features and advantages: research on co-evolution of life and environment during major geological catastrophic periods, microbial processes, and global changes, etc.</p> <p>该方向以表生地球系统为研究对象，主要运用地质学与生物学的相关理论和研究方法开展生物圈与地球其他各圈层之间相互作用的研究。主要研究领域包括：生物群落演替与地球环境演变、生物地球化学与全球变化、矿物-微生物相互作用、极端环境微生物等方面。特色与优势：重大地质突变期生命与环境协同演化、微生物过程与全球变化等。</p>

三、Study Period and Credit Requirement 学习年限与学分要求

The length of study for doctoral students in China is generally 4 years, the maximum of study period is 6 years, and the credits should be no less than 21. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for Master student and Ph.D. student are interconnected, and in general each credit is equivalent to 16 class hours.

来华留学博士研究生学制4年，最长学习年限6年，不少于21学分。课程设置包括公共学位课、专业必修课、专业选修课及必修环节。研究生课程采取硕博打通模式，一般每学分对应16课内学时。

四、Curriculum Settings 课程设置

Course Type 课程类别	Course Number 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
Public Courses 公共学位课	X21504001	Chinese Language 汉语	80	5	Autumn 秋季	——	
	X21504003	General Introduction of China 中国概况	32	2		——	
	X21504004	HSK level 3 HSK 三级	16	1		——	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1			
Compulsory Courses 专业学位课	X21504006	Review of Scientific Literature 科技文献综述	48	3			
	X21301001	Progress in Earth Sciences 地球科学进展	48	3	Autumn 秋季	School of Earth Sciences and Resources 地球科学与资源学院	Core and Compulsory 核心课程 必选
	B21301001	Advanced Methods and Frontiers of Mineralogy, Petrology and Ore Deposit 矿物学、岩石学和矿床学先进方法和前沿	32	2	Autumn 秋季	School of Earth Sciences and Resources 地球科学与资源学院	≥4 credits 不少于 4 学分
	B21501001	High-temperature geochemistry and cosmochemistry 高温地球化学与宇宙化学	32	2	Autumn 秋季	Institute of Earth Sciences 科学研究院	
	B21301002	Advanced Paleobiology 高级古生物学	32	2	Spring 春季	School of Earth Sciences and Resources 地球科学与资源学院	

Course Type 课程类别	Course Number 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
	B21301003	Advanced tectonic geology 高级构造地质学	32	2	Spring 春季	School of Earth Sciences and Resources 地球科学与资源学院	
	B21301006	Reconstruction of Quaternary Climate 第四纪气候重建	16	1	Autumn 秋季	School of Earth Sciences and Resources 地球科学与资源学院	
	B21301004	Global change and Geomicrobiology 全球变化与地球微生物学	32	2	Spring 春季	School of Earth Sciences and Resources 地球科学与资源学院	
	B21305001	Advances in Water Resources and Environment 水资源与环境研究进展	32	2	Autumn 秋季	Water Resources and Environment 水资源与环境学院	
	X21305001	Remediation of Groundwater Pollution 地下水污染修复	16	1	Autumn 秋季	Water Resources and Environment 水资源与环境学院	
	X21305002	Uncertainty Analysis for Groundwater Flow Modeling 地下水模拟不确定性分析	16	1	Autumn 秋季	Water Resources and Environment 水资源与环境学院	
	X21305003	Hydrogeochemical processes and PHREEQC modeling 水文地球化学过程与 PHREEQC 模拟	32	2	Autumn 秋季	Water Resources and Environment 水资源与环境学院	

Course Type 课程类别	Course Number 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
	B21301027	Formation and Evolution of a Habitable Earth 宜居地球的形成和演化	32	2	Autumn 秋季	School of Earth Sciences and Resources 地球科学与资源学院	
Optional Courses 专业选修课	X21314001	Taijiquan (24-forms) 24式简化太极拳	16	1		Department of P. E. 体育部	
	X21308001	English Film Appreciation 影视欣赏	32	2		School of Foreign Language 外国语学院	
Compulsory Parts 必修环节	Basic Practice of Chinese 汉语基础实践			1	Autumn	—	
	Chinese Professional application 汉语专业应用			2	Summer	—	
	Dissertation Proposal 论文开题报告			—			具体要求见《中国地质大学(北京)研究生学位论文开题暂行管理办法》
	Dissertation Progress Report 论文中期报告			—			具体要求见《中国地质大学(北京)研究生中期考核实施办法》
	Academic Presentation 作学术报告			—			≥1 presentation at academic conferences 参加国内外学术会议, 至少作报告1次
	Pre-oral defense 预答辩			—			

Remarks: Public Courses are offered by International Cooperation and Exchange Office.

备注: 公共学位课、必修环节中 Basic Practice of Chinese 汉语基础实践、Chinese Professional application 汉语专业应用由国际合作与交流处统一开设。

五、Catalogue of Classic Works and Professional Academic Journals for Reading 推荐阅读经典著作和专业学术期刊目录

1. Classic Works

(一) 经典著作

Mineralogy, Petrology, Mineral Deposit Geology

矿物学、岩石学、矿床学方向

1. Chen, G., Li, S., et al., Genetic mineralogy and prospecting mineralogy, Chongqing Publishing House, 1987.

陈光远, 李胜荣等, 成因矿物学与找矿矿物学, 重庆出版社, 1987.

2. Xiao, Q., Deng, J., Ma, D., et al., Research thinking and Methods of Granite Research, Geological Publishing House, 2004.

肖庆辉, 邓晋福, 马大铨等, 花岗岩研究思维与方法, 地质出版社, 2004.

3. Deng, J., Luo, Z., et al., Rock Origin, Tectonic Environment and Mineralization, Beijing, Geological Publishing House, 2004.

邓晋福, 罗照华等, 岩石成因、构造环境与成矿作用, 北京, 地质出版社, 2004.

4. 翟裕生等, 矿田构造学, 地质出版社, 1993.

5. Zhai, Y. et al., Regional Mineralization, Geological Publishing House, 1999.

翟裕生等, 区域成矿学, 地质出版社, 1999.

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翟裕生, 成矿系统论, 地质出版社, 2010.

8. Gill Robin, Igneous Rocks and Process: a practical guide, Willey-blackwell, 2011.

9. Best M.G., Igneous and metamorphic petrology. 2nd edition. Blackwell Science Ltd, 2003.

10. Prothero D.R. and Schwab, F.L., Sedimentary Geology: An introduction to Sedimentary Rocks and Stratigraphy, Second edition, 1996.

11. Demange M.A., Minerals for Petrologists: Optics, Chemistry and Occurrences of Rock-Forming Minerals, CRC press, 2012.

12. Blatt Harvey, Tracy Robert J., Owens Brent Edward et al., Petrology: Igneous, Sedimentary, and Metamorphic, W H Freeman & Co, 2005.

13. Guilbert J.M., Park C.F., The geology of ore deposits, 1986.

14. Misra K.C, Understanding mineral deposits, Kluwer Academic Publishers, 2000.

15. Robb L.J., Blackwell., Introduction to ore-forming processes, Blackwell Pub., 2005.

16. Pirajno F., Hydrothermal processes and mineral systems, Springer, 2009.

Geochemistry

地球化学方向

17. White W.M., Geochemistry, Wiley-Blackwell publishing, 2013.

18. Andrews J.E., Brimlcombe P, Jickells T.D., Liss P.S., Reid B., An Introduction to

- Environmental Chemistry, Blackwell publishing, Second Edition, 2004.
19. Faur G., Principle of Isotope Geology, New York: John Wiley & Sons, 1986.
 20. Joechem H., Stable isotope geochemistry, Springer, 2004.
 21. Faure G., Principles and applications of Geochemistry, 2nd ed., Cambridge University Press, 1998.
 22. Treatise on Geochemistry Elsevier, 2003.
 23. Eby G. N., Principle of Environmental Geochemistry, Brooks / Cole – Thomas Learning, 2004.

Paleontology and Stratigraphy

古生物学与地层学方向

24. 沙金庚, 世纪飞跃-辉煌的中国古生物学, 科学出版社, 2009.
 25. Gong, Y. & Zhang, K., Fundamentals and Frontiers of Stratigraphy (Second Edition), China University of Geosciences Press, 2016.
- 龚一鸣, 张克信, 地层学基础与前沿 (第二版), 中国地质大学出版社, 2016.
26. Michael F., Miller A.I., Raup D.M., Stanley S.M., Freeman W.H., Principles of Paleontology, 2007.
 27. Hammer A., Harper, D.A.T., Paleontological Data Analysis, Wiley-Blackwell, 2008.
 28. Jain S., Fundamentals of Invertebrate Palaeontology, Springer, 2017.
 29. Armstrong H.A., Brasier M.D., Microfossils, 2nd ed., Oxford: Blackwell, 2005.
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Structural Geology

构造地质学方向

39. Wan, T., The Tectonics of China, Geological Publishing House, July 2011.
- 万天丰, 中国大地构造纲要, 地质出版社, 2004.
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 41. Ernst R., Large Igneous Province, Cambridge University Press, 2014.
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 43. Fossen H., Structural Geology, Cambridge University Press, 2005.

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45. Kearey P., Klepeis A.K., Vine J. F., *Global Tectonics*, Wiley-Blackwell, 3rd Edition, 2008.
46. Turcotte L.D., Schubert G., *Geodynamics*, Cambridge University Press, 3rd Edition, 2002.
47. Allen A.P., Allen R.J., *Basin Analysis: Principles and Application to Petroleum Play Assessment-3rd Edition*, Wiley-Blackwell, 2013.
48. Busby C., Azor A., *Tectonics of Sedimentary Basins*, Wiley-Blackwell, 2012.
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51. Ramsay J.G., Lisle R.J., *The techniques of modern structural geology: Applications of continuum mechanics in structural geology*. Academic Press, London, Vol. 3, 2000.

Quaternary Geology

第四纪地质学方向

52. Liu, D., *Loess and Arid Environment*, Anhui Science and Technology Press, 2009.
刘东生, 黄土与干旱环境, 安徽科学技术出版社, 2009.
53. Liu, D., et al., *Quaternary Environment*, Beijing: Science Press, 1997.
刘东生等, 第四纪环境, 北京: 科学出版社, 1997.
54. 刘东生, 安芷生, 黄土•第四纪地质•全球变化(第三集), 北京: 科学出版社, 1992.
55. Liu, D., et al., *Loess and Environment*, Beijing: Science Press, 1985.
刘东生等, 黄土与环境, 北京: 科学出版社, 1985.
56. 黄春长, 环境变迁. 北京: 科学出版社, 1998.
57. 杨子庚, 林和茂, 中国第四纪地层与国际对比, 北京: 地质出版社, 1996.
58. Tian, M. & Cheng, J., *Quaternary Geology and Geomorphology*. Beijing: Geological Publishing House, 2020.
田明中等, 天造地景, 北京: 中国旅游出版社, 2012.
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62. Gallagher, K., Wainwright J., *Landscape evolution: denudation, climate and tectonics over different time and space scales*, Geological Society of London, 2008.
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65. Ruddiman W., Earths Climate Past and Future, Second Edition, 2007.

Gemology

珠宝学方向

66. 何明跃等, 翡翠, 中国科技技术出版社, 2018.

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余晓艳, 有色宝石学教程 (第二版), 地质出版社, 2016.

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郭颖, 玉雕与玉器, 地震出版社, 2007.

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70. 白峰, 中国玉器概论, 化学工业出版社, 2017.

71. 张蓓莉, 系统宝石学 (第二版), 地质出版社, 2006.

72. 吴瑞华, 白峰, 卢琪, 钻石学教程, 地质出版社, 2005.

73. 古柏林, 张瑜生 译, 宝石内含物大图解, 大知出版社, 1995.

74. Pedersen M.C., Gem and Ornamental Materials of Organic Origin, NAG Press, London, 2010.

75. Harlow G.E., The Nature of Diamonds, 1998.

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77. Nassau K., Gemstone Enhancement: History, Science and State of the Art, Butterworth-Heinemann, 1994.

78. Read P.G., Gemology, Elsevier, 2005.

Hydrogeology

水文地质学方向

79. Applied Environment Microbiology, American Society for Microbiology

80. Bioresource Technology, Elsevier

81. Environmental Science & Technology, American Chemical Society

82. Ground Water, Elsevier

83. Journal of Contaminant Hydrology, Elsevier

84. 地学前缘, 中国地质大学 (北京)

85. 环境科学学报, CNKI

Planetary Science and Comparative Planetology

行星地质与比较行星学方向

86. Ouyang, Z., Introduction to Lunar Science, China Aerospace Press, Beijing, 2005.

欧阳自远, 月球科学概论, 中国宇航出版社, 北京, 2005.

87. 欧阳自远, 邹永廖, 火星科学概论, 上海科技教育出版社, 上海, 2015.
88. 陈建平等, 月球地质研究与编图, 地质出版社, 北京, 2014.
89. 贵阳地球化学研究所, 月止血研究进展, 科学出版社, 北京, 1977.
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91. 史蒂文 文伯格, 宇宙学【M】, 向守平 译, 合肥: 中国科技大学出版社, 合肥, 2013.
92. Hodges C A., Moore H J., Atlas of volcanic landforms on Mars, 1994.
93. Rossi A P., Van Gasselt S., Planetary Geology, 2018.
94. Melosh H J., Impact cratering: a geologic process, 1989.
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96. Pike R J., Geometric interpretation of lunar craters, 1980.

Biogeology

地球生物学方向

97. 谢树成等, 地球生物学, 科学出版社, 2011.
98. 中国科学院, 地球生物学, 科学出版社, 2015.
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100. 董海良, 蒋宏忱, 地质微生物学, 高等教育出版社, 2021.
101. 汪品先, 田军, 黄恩清, 马文涛, 地球系统与演变, 科学出版社, 2018.
102. 戎嘉余, 袁训来, 詹仁斌, 邓涛, 生物演化与环境, 中国科学技术出版社, 2018.
103. Chameides W. L., Perdue E. M. (著), 张晶 (译), 生物地球化学循环, 高等教育出版社, 2012.
104. Ehrlich H. L., Newman D. K. (著), 王增林, 王世虎, 李希明 (译), 地质微生物学, 中国石化出版社, 2020.
105. 张自立, 王振英, 系统生物学, 科学出版社, 2009.

2. Professional Journals (in alphabetical order)

(二) 专业学术期刊目录 (按英文字母排序)

1. 宝石及宝石学杂志
2. 冰川冻土
3. 沉积学报
4. 地理学报
5. 地球科学
6. 地学前缘
7. 地质学报

8. 第四纪研究
9. 古地理学报
10. 古脊椎动物学报
11. 古人类学报
12. 古生物学报
13. 光谱学与光谱分析
14. 海洋地质与第四纪地质
15. 环境科学
16. 环境科学学报
17. 矿床地质
18. 矿物学报
19. 科学通报
20. 水利学报
21. 水科学进展
22. 水文地质工程地质
23. 微体古生物学报
24. 现代地质
25. 岩石学报
26. 岩石矿物学杂志
27. 中国科学 D 辑
28. 中国地质
29. 中国环境科学
30. Advances in Water Resources
31. Annual Review of Earth and Planetary Sciences
32. American Mineralogist
33. Astrobiology
34. Basin Research
35. Carbonate sedimentology
36. Chemosphere
37. Earth and Planetary Science Letter
38. Earth-Science Reviews
39. Economic Geology
40. Environmental Geology
41. Environmental Science & Technology
42. Environmental Pollution
43. Gems and Gemology

44. Geobiology
45. Geochimica et Cosmochimica Acta
46. Geochemistry
47. Geological Society of America Bulletin
48. Geology
49. Geomicrobiology Journal
50. Geomorphology
51. Groundwater
52. Hydrogeology Journal
53. Hydrological Processes
54. Hydrology and Earth System Sciences
55. Lethaia
56. Lithos
57. Marine Geology
58. Mineralium Deposita
59. National Science Review
60. Journal of Contaminant Hydrology
61. Journal of Geophysics Research-Solid Earth.
62. Journal of Hydrology
63. Journal of Hazardous Materials
64. Journal of Paleontology
65. Journal of Petrology
66. Journal of Sedimentary Research
67. Journal of Structural Geology
68. Journal of Structural Geology Elsevier
69. Nature
70. Nature Geoscience
71. Ore Geology Reviews
72. Palaeogeography Palaeoclimatology Palaeocology
73. Palaios
74. Paleobiology
75. Palaeontology
76. Precambrian Research
77. Physics of the Earth's Deep Interiors
78. Quaternary Geochronology
79. Quaternary International
80. Quaternary Research
81. Quaternary Science Reviews
82. Science

83. Science of the Total Environment
84. Sedimentary Geology
85. Sedimentology
86. Tectonics
87. Tectonophysics
88. The Holocene
89. The Journal of Gemmology
90. Journal of Vertebrate Paleontology
91. Water Research
92. Water Resource Research

(0815) Hydraulic Engineering Training Program for International Doctoral Student

(0815) 水利工程 博士留学生 培养方案

一、Training Goal 培养目标

The Doctoral degree programs of hydraulic engineering is aimed at training high-level talents in the area of hydrologic sciences and water resources management, in keeping a friendship attitude with China, a global view, a spirit of innovation and a rigorous style of study, complying with the academic norms and professional ethics, establishing a broad and solid foundation of knowledge in science and engineering, mastering theories, methods and techniques in hydraulic engineering, being familiar with the properties and roles of groundwater, working smoothly in scientific writing and international academic communications, achieving deep studies and innovative researches on a frontier topic in hydraulic engineering. Graduated Ph.D. students are adequate for high-level jobs of hydraulic engineering management, research, teaching or project design in government departments, scientific and education institutions or enterprises.

水利工程博士学位点致力于培养水文科学与水资源管理领域的高层次人才，对华友好，具有国际化视野和创新精神，学风严谨、恪守学术规范与职业道德，具备宽厚扎实的理工科知识基础，掌握水利工程领域的理论和技术方法，熟悉地下水的特性和作用，胜任科技论文写作和国际学术交流，在水利工程领域某个前沿方向有深入的研究，取得创新性的研究成果。毕业博士能够在政府管理部门、科研教育机构或企业的高级岗位承担水利工程领域的管理、科研、教学或项目设计工作。

二、Research Directions 研究方向

Research Direction 研究方向	Research Content 研究内容
1. Hydrology and Water Resources 水文学及水资源	<p>Mainly study on hydrological processes at the basin and field scales, including water balance and runoff variation patterns in catchments, changing trends in water resources, moisture and salt transfer in the soil-plant-atmosphere continuum, climato-hydrological models, distributed hydrological modeling and rational development and utilization of water resources, etc.</p> <p>以流域和田间尺度水文过程为主，研究流域水量转化与径流变化规律、水资源变化趋势、土壤-植物-大气连续体水盐交换机理、气候水文模型、分布式水文模型以及水资源合理开发利用等。</p>

Research Direction 研究方向	Research Content 研究内容
2. Groundwater Sciences and Engineering 地下水科学与工程	<p>Study on scientific and engineering problems of groundwater, including groundwater recharge and discharge, groundwater circulation and evolution processes, characteristics of aquifers, survey and monitoring methods in sub-surface hydrology, groundwater resources assessment, groundwater modeling as well as utilization and protection of groundwater resources, etc.</p> <p>研究地下水的科学与工程问题，包括地下水补给与排泄、地下水循环演变规律、含水层类型特征、地下水文调查与观测方法、地下水资源评价、地下水模拟、地下水开发利用与保护工程等。</p>

三、Study Period and Credit Requirement 学习年限与学分要求

The length of study for doctoral students in China is generally 4 years, the maximum of study period is 6 years, and the credits should be no less than 21. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for postgraduate students and Ph.D. students are interconnected, and in general each credit is equivalent to 16 class hours.

来华留学博士研究生学制 4 年，最长学习年限 6 年，不少于 21 学分。课程设置包括公共学位课、专业必修课、专业选修课及必修环节。研究生课程采取硕博打通模式，一般每学分对应 16 课内学时。

四、Curriculum Settings 课程设置

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
Public Courses 公共学位课	X21504001	Chinese Language 汉语	80	5	Autumn	—	
	X21504003	General Introduction of China 中国概况	32	2		—	
	X21504004	HSK level 3 HSK 三级	16	1		—	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1		—	
Compulsory Courses 专业学位课	X21504006	Review of Scientific Literature 科技文献综述	48	3			
	X21301001	Progress in Earth Science 地球科学进展	48	3			

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
Optional Courses 专业选修课	B21305001	Advances in Water Resources and Environment 水资源与环境研究进展	32	2	Autumn	School of Water Resources and Environment 水资源与环境学院	≥2 credits 不少于2学分
	X21314001	Taijiquan(24-forms) 24式简化太极拳	16	1		Department of P. E. 体育部	
Compulsory Parts 必修环节	Basic Practice of Chinese 汉语基础实践			1	Autumn	——	
	Chinese Professional application 汉语专业应用			2	Summer	——	
	Thesis Opening Report 论文开题报告			——			
	Interim Report 论文中期报告			——			
	Academic report delivery 作学术报告			——			
	Pre-oral defense 预答辩			——			

Remarks: Public Courses are offered by International Cooperation and Exchange Office.

备注：公共学位课、必修环节中 Basic Practice of Chinese 汉语基础实践、Chinese Professional application 汉语专业应用由国际合作与交流处统一开设。

五、Catalogue of Classic Works and Professional Academic Journals for Reading 推荐阅读经典著作和专业学术期刊目录

1. Hydraulics of Groundwater, Jacob Bear, McGraw-Hill, 1979
2. Handbook of Hydrology, David R. Maidment (ed), McGraw-Hill, 1992
3. Water Resource Research, America Geophysical Union
4. Advances in Water Resources, Elsevier Sci Ltd
5. Journal of Hydrology, Elsevier Science BV
6. Hydrogeology Journal, Springer-Verlag Berlin, IAH
7. Hydrological Processes, John Willey & Sons Ltd
8. Hydrology and Earth System Sciences, the European Geosciences Union

9. Groundwater, Ground Water Publishing CO
10. Journal of Contaminant Hydrology, Elsevier Science BV
11. 水利学报, CNKI
12. 水科学进展, CNKI
13. 水文地质工程地质, CNKI
14. 水动力学研究与进展, CNKI

(0816) Surveying and Mapping Training Program for International Doctoral Student

(0816) 测绘科学与技术 博士留学生培养方案

一、Training Goal 培养目标

The purpose of this major is to cultivate research-oriented talents of surveying and mapping of geographic information major with solid theoretical foundation, systematic professional knowledge and professional skills, good moral quality, and a deep understanding of the progress and dynamics of modern surveying and mapping science and technology, for better integration with the development of the society. Specific training objectives are as follows:

1. Understand Chinese culture and basic national conditions, adhere to the political position of being friendly to China, respect Chinese social ethics and customs, abide by laws and regulations, conduct properly, be honest and trustworthy, be physically and mentally healthy, and have good scientific research ethics and professional dedication.

2. Master the theories and methods of geographical information's acquisition, processing and comprehensive analysis, possess profound scientific and technical theoretical literacy of surveying and mapping, and understand the latest information of the development of scientific and technological in the Domestic and foreign research status.

3. Chinese proficiency requires preliminary ability to use daily language and read Chinese materials of the major.

4. Be able to host and implement scientific research projects that intersect with geo-knowledges and other related disciplines and innovative research projects in the frontier of surveying and mapping science and technology.

5. Have good interpersonal communication and team work ability, be practical and realistic, and have rigorous scientific style.

本专业旨在培养具有坚实的理论基础、系统的专业知识和熟练的专业技能，具备良好道德素养和科学精神，富有创新意识和国际学术视野，面向社会发展所需的测绘地理信息专业创新人才。具体培养目标如下：

1、了解中国文化和基本国情，坚持对我国友好的政治立场，尊重中国的社会公德和风俗习惯，遵纪守法，品行端正，诚实守信，身心健康，具有良好的科研道德和敬业精神。

2、熟练掌握地理空间信息的获取、处理、综合分析的理论和方法，具备深厚的测绘科学技术理论素养，开阔的国际视野和出众的知识综合与科研创新能力；

- 3、汉语水平要求具有使用生活用语和阅读本专业汉语资料的初步能力；
- 4、能够主持和实施与地学等相关学科交叉的科学研究项目和测绘科学与技术前沿的创新性研究项目；
- 5、具有良好的人际交往与团队合作能力，具有实事求是、严谨的科学作风。

二、Research Directions 研究方向

Research Direction 研究方向	Research Content 研究内容
1.Geodesy and surveying engineering 大地测量学与测量工程	<p>To study the shape and gravity field of the earth and its neighboring planets and their time-varying regulations, as well as the precise determination of space point positions and deformation monitoring. The main research areas include: modern surveying data processing theory and method, precision engineering surveying, satellite geodesy and its application, crustal deformation monitoring and geodesy inversion, navigation positioning and position service, etc.研究地球及其邻近星体形状和重力场及其随时间变化的规律、以及空间点位置精密测定和变形监测等理论与技术方法。主要研究内容包括：现代测量数据处理理论与方法、精密工程测量、卫星大地测量与应用、地壳形变监测与大地测量反演、导航定位与位置服务等。</p>
2.Photographic surveying and remote sensing 摄影测量与遥感	<p>To research the acquisition, interpretation and application of surface, environment and process information using aerospace, aeronautical and ground equipment. The main research areas include: imaging mechanism and model, digital photographic surveying, microwave remote sensing, laser radar, high resolution remote sensing image processing and analysis, intelligent interpretation of remote sensing big data, remote sensing and geographic applications of resources, environment and planets, etc.研究利用航天、航空和地面设备对地表、环境及过程获取信息，并进行解译与应用。主要研究内容包括：成像机理与模型、数字摄影测量、微波遥感、激光雷达、高分辨率遥感图像处理与分析、遥感大数据智能解译、资源环境与行星遥感及地学应用等。</p>
3.Cartography and geographic information engineering 地图制图学与地理信息工程	<p>To study the theoretical basis and application methods of earth space information system, and the ontology model, cognitive model, semantic model and multidimensional dynamic model of earth space information. The main research areas include: spatial analysis modeling, three-dimensional city simulation and virtual geographic environment, spatial information fusion and sharing and network service, geographic space intelligence, GIS software engineering, etc.研究地球空间信息系统的理论基础和应用方法，研究地球空间信息的本体模型、认知模型、语义模型及多维动态模型。主要研究内容包括：空间分析建模、三维城市模拟和虚拟地理环境、空间信息融合共享与网络服务、地理空间智能、GIS 软件工程等。</p>

Research Direction 研究方向	Research Content 研究内容
4.Intelligent earth observation, disaster prevention and mitigation 地球智能观测与防灾减灾	To study the application theories and methods of earth intelligent observation and disaster prevention and mitigation, such as survey data processing, InSAR geodesy, near-surface change monitoring and disaster perception, remote sensing of resources and environment and analysis of geographical conditions.研究测量数据处理与 InSAR 大地测量, 近地表变化监测与灾变过程感知, 资源环境遥感与地理国情分析等地球智能观测及防灾减灾应用理论与方法。

三、Study Period and Credit Requirement 学习年限与学分要求

The length of study for doctoral students in China is generally 4 years, the maximum of study period is 6 years, and the credits should be no less than 21. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for postgraduate students and Ph.D. students are interconnected, and in general each credit is equivalent to 16 class hours.

来华留学博士研究生学制 4 年, 最长学习年限 6 年, 不少于 21 学分。课程设置包括公共学位课、专业必修课、专业选修课及必修环节。研究生课程采取硕博打通模式, 一般每学分对应 16 课内学时。

四、Curriculum Settings 课程设置

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
Public Courses 公共学位课	X21504001	Chinese Language 汉语	80	5	Autumn	—	
	X21504003	General Introduction of China 中国概况	32	2		—	
	X21504004	HSK level 3 HSK 三级	16	1		—	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1		—	
Compulsory Courses 专业	X21504006	Review of Scientific Literature 科技文献综述	48	3			

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
学位课	X21301001	Progress in Earth Science 地球科学进展	48	3			
Optional Courses 专业 选修课	X21312001	Progress in Surveying and Mapping Science and Technology 测绘科学与技术进展	32	2	Autumn	School of Land Science And Technology 土地科学技术学院	≥2 credits 不少于2学分
	X21312002	Space Geodesy 空间大地测量	16	1	Autumn		
	X21314001	Taijiquan(24-forms) 24式简化太极拳	16	1		Department of P. E. 体育部	
Compulsory Parts 必修环节	Basic Practice of Chinese 汉语基础实践			1	Autumn	——	
	Chinese Professional application 汉语专业应用			2	Summer	——	
	Thesis Opening Report 论文开题报告			——			
	Interim Report 论文中期报告			——			
	Academic report delivery 作学术报告			——			
	Pre-oral defense 预答辩			——			

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五、Catalogue of Classic Works and Professional Academic Journals for Reading 推荐阅读经典著作和专业学术期刊目录

Book:

著作:

1. Design and Implementation of Geographic Information System. Xincan Wu et al, Publishing House of Electronics Industry

《地理信息系统设计与实现（第二版）》，电子工业出版社，吴信才等；

2. GIS design and implementation. Manchun Li et al, Science Press

- 《GIS 设计与实现》，科学出版社，李满春等；
3. Principles and Methods of Geographic Information System Software Engineering. Shuoben Bi et al, Science Press
《地理信息系统软件工程的原理与方法》，科学出版社，毕硕本等
 4. Principles and Methods of Remote Sensing Application Analysis. Yingshi Zhao et al, Science Press
《遥感应用分析原理与方法》，赵英时等著，科学出版社,2003 年
 5. Spatial analysis in GIS. Xiangnan Liu et al, Science Press
GIS 空间分析(第三版) 刘湘南等 科学出版社
 6. Remote Sensing and Geoscience Application. Dongping Ming et al, Science Press
遥感地学应用 明冬萍等 科学出版社
 7. Geostatistics (Spatial statistical analysis). Xinqi Zheng et al, Science Press
地统计学(空间统计分析) 郑新奇等 科学出版社
 8. Land management geographic information system. Xinqi Zheng et al, Wuhan University Press
土地管理地理信息系统 郑新奇等 武汉大学出版社
 9. Spatial analysis technology and application of landscape pattern. Xinqi Zheng et al, Science Press
景观格局空间分析技术及其应用 郑新奇等 科学出版社
 10. Fuzzy forecasting and comprehensive assessment information system about urban environment. Tingyan Xing et al, China University of Geosciences Press
城市环境模糊预测与综合评价信息系统 邢廷炎等 中国地质大学出版社
 11. Remote sensing cloud computing and scientific analysis: Application and practice. Jinwei Dong et al, Science Press
遥感云计算与科学分析：应用与实践 董金玮等 科学出版社
 12. Digital Elevation Model. Zhilin Li et al, Wuhan University Press
《数字高程地面模型》李志林等，武汉测绘科技大学出版社
 13. Principles of probability statistics and applications in measurement. Qinghai Li et al, Surveying and Mapping Publishing House
《概率统计原理和在测量中的应用》李庆海等，测绘出版社
 14. Resource remote sensing and mapping. Zhaohong Bu, Nanjing Institute of Technology Press
《资源遥感与制图》卜兆宏等，南京工业出版社
 15. Microwave remote sensing technology and application. Shousheng Xie et al, Publishing

House of Electronics Industry

《微波遥感技术与应用》谢寿生等，电子工业出版社

16. Radar image analysis and geological application. Donghua Guo, Science Press

《雷达图象分析及地质应用》郭华东，科学出版社

17. 《Geodesy》Wolfgang Torge, Walter de Gruyter & Co

18. 《GPS Satellite Surveying》ALFRED LEICK 等, Wiley

19. 《Digital Image Processing》Kenneth R. Castleman, Prentice Hall

20.《Geographic Information Systems and Science》Paul Longley, Michael F. Goodchild, John Wiley and Sons

21.《Introduction to Remote Sensing》James B. Campbell, Randolph H. Wynne, The Guilford Press

22. Principles and methods of geographical information systems. Xincan Wu et al, Publishing House of Electronics Industry

《地理信息系统原理与方法》吴信才等，电子工业出版社

23. Design and implementation of geographical information systems. Xincan Wu et al, Publishing House of Electronics Industry

《地理信息系统设计与实现》吴信才等，电子工业出版社

24. Introduction to Maps. Qi Wang et al, China University of Geosciences Press

《地图概论》王琪等，中国地质大学出版社

25. Spatial Databases: A Tour. Shashi Shekhar et al, China Machine Press

《空间数据库》shekhar 著，谢昆青译，机械工业出版社

26. Integration and Realization of Spatial Information System. Deren Li, Wuhan University Press

《空间信息系统的集成与实现》李德仁等，武汉测绘科技大学出版社

27. Principles and Algorithms of Geographic Information System. Lixin Wu et al. Science Press

《地理信息系统原理与算法》吴立新等，科学出版社

28. Geographic Information System Fundamentals. Jianya Gong, Science Press

《地理信息系统基础》龚健雅，科学出版社

29. Geographic Information System. Shouyi Lu, Higher Education Press

《地理信息系统》陆守一等，高等教育出版社

30. Spatial Analysis and Geovisualization in GIS. Bin Jiang et al, Higher Education Press

《GIS 环境下的空间分析和地学视觉化》江滨等，高等教育出版社

31. Principles and Methods of Geographic Information System Integration. Guonian Lv,

Science Press

《地理信息系统集成原理与方法》 闫国年等， 科学出版社

32. Digital City—Theory, method and Application. Jicheng Cheng et al, Science Press

《数字城市—理论、方法与应用》 承继成等， 科学出版社

33. Three-dimensional data field visualization. Zesheng Tang, Tsinghua University Press

《三维数据场可视化》 唐泽圣， 清华大学出版社

34. Photogrammetry. Jianqing Zhang, Li Pan, Shugen Wang, Wuhan University Press

《摄影测量学（第二版）》 张剑清、潘励、王树根， 武汉大学出版社

35. Digital photogrammetry. Zuxun Zhang, Jianqing Zhang, Wuhan University Press

《数字摄影测量学》 张祖勋、张剑清， 武汉大学出版社

36. Key scientific issues of quantitative remote sensing. Renhua Zhang, Higher Education Press

《定量遥感若干关键科学问题研究》 张仁华， 高等教育出版社

37. InSAR Technology Principle and Practice, Yang Honglei, et al., Science Press

《InSAR 技术原理及实践》 杨红磊等， 科学出版社。

Professional Academic Journal:

专业学术期刊:

1. Acta Geodaetica et Cartographica Sinica (拉丁语)

测绘学报

2. Geomatics and Information Science of Wuhan University

武汉大学学报（信息科学版）

3. Bulletin of Surveying and Mapping

测绘通报

4. Journal of Geodesy and Geodynamics

大地测量与地球动力学

5. Science of Surveying and Mapping

测绘科学

6. Journal of Geomatics

测绘信息与工程（更名为测绘地理信息）

7. National Remote Sensing Bulletin

遥感学报

8. Journal of Image and Graphics

中国图象图形学报.

9. Earth Science
地球科学
10. Journal of Software
软件学报
11. Chinese Journal of Computers
计算机学报
12. Journal of Computer Research and Development
计算机研究与发展
13. Journal of Chinese Computer Systems
小型微型计算机系统
14. Computer Science
计算机科学.
15. Computer Engineering and Applications
计算机工程与应用
16. Journal of Chinese Mini-Micro Computer
微型计算机
17. Application Research of Computers
计算机应用研究
18. Journal of Computer-Aided Design & Computer Graphics
计算机辅助设计与图形学学报
19. Computer Systems & Applications
计算机系统应用
20. Computer Engineering
计算机工程
21. Computer Applications and Software
计算机应用与软件
22. International Journal of Geodesy
23. Survey Review
24. ISPRS Journal of Photogrammetry and Remote Sensing
25. International Journal of Digital Earth
26. Remote Sensing
27. Cartographic Journal
28. Photogrammetric Engineering and Remote Sensing
29. Mathematical Geosciences

30. Remote Sensing of Environment
31. International Journal of Geographical Information System
32. International Journal of Remote Sensing
33. Computer Vision, Graphics, and Image Processing
34. Computer & Graphics
35. Computers & Geosciences
36. Computers, Environment and Urban Systems
37. Computer Aided Geometric Design
38. The Computer Journal
39. IEEE Transactions on Geoscience and Remote Sensing
40. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing
41. International Journal of Image and Data Fusion

(0818)Geological Resources and Geological Engineering Training Program for International Doctoral Student

(0818) 地质资源与地质工程 博士留学生培养方案

一、 Training Goal 培养目标

A PhD candidate should understand Chinese culture and basic national conditions, adhere to the political position of being friendly to China, respect China's social ethics and customs, abide by discipline and law, have good conduct, be honest and trustworthy, be physically and mentally healthy, have good scientific research ethics, professionalism and rigorous style of study. The doctoral degree program is designed to prepare individuals for occupations in solid, fluid, and unconventional energy resources; resource exploration, detection, evaluation, development, and drilling; geological environment; geological disaster detection and prevention; etc. The general requirements for doctoral degrees include good academic ethics, learning ability, the ability to discover and solve complex problems, academic communication skills and teamwork spirit. This program is aimed to strengthen students' foundation in mathematics, physics, chemistry, mechanics, engineering, computer science and earth science; foster their professional skills in mineral and groundwater resources exploration; enhance their mastery of the simulation, testing, and analytical techniques commonly used in the field of geological engineering; develop their ability to comprehensively apply the methods and technologies in geology, geochemistry, geophysics, remote sensing, modern examination, engineering technology, and computing; and inspire their creativity and potential in solving cutting-edge scientific and major technical problems. The degree recipients should have the ability to independently engage in scientific research in mineral survey and exploration, geological engineering, earth exploration and information technology, geological equipment engineering, resources and environment remote sensing, and the quality of organizing and implementing scientific research projects. The program emphasizes on engineering ethics and comprehensive utilization of resources; pays attention to green resources, sustainable development under the guidance of "CO₂ emission peak and carbon neutrality", and harmonious development of human and nature; values the improvement of comprehensive quality, and highlights the integration of multiple disciplines and the application of high-tech. Chinese proficiency requires the ability to use life language and read Chinese materials of this major.

了解中国文化和基本国情，坚持对我国友好的政治立场，尊重中国的社会公德和风俗习惯，遵纪守法，品行端正，诚实守信，身心健康，具有良好的科研道德，敬业精神以及严谨的学风。培养具有从事固体、流体、非常规能源矿产、地下水等资源勘查、探

测、评价、开发、钻探以及地质环境、地质灾害探测、防治能力的高水平、国际化创新科技与管理人才。掌握各类资源矿产和地下水资源的勘查理论和专业技能，掌握地质工程领域常用的仿真、测试、实验分析技术方法，能够综合运用地质、地球化学、地球物理、遥感、现代测试、工程技术以及计算机等方法、技术，创新地运用本学科理论和方法探索前沿科学问题和解决重大技术难题。具有独立从事矿产普查与勘探，地质工程，地球探测与信息技术，地质装备工程，资源与环境遥感等方向科学研究的能力和组织实施科研项目的素质。注重绿色资源与“双碳”背景下的可持续发展以及人文自然和谐发展，注重综合素质提升，突出多学科交叉融合和高新技术的应用。汉语水平要求具有使用生活用语和阅读本专业汉语资料的能力。

二、Research Direction 主要研究方向

<p>Research Direction 研究方向</p>	<p>Research Contents 研究内容</p>
<p>1.Mineral Resource Prospecting and Exploration 矿产普查与勘探</p>	<p>Taking various solid and fluid resources as the research objects, the research in this discipline focuses on the theories, technologies and methods of mineral resource exploration, evaluation, prediction, development, and utilization. Under the guidance of the modern earth system sciences, the main research goal is to optimize the comprehensive benefits of geology, resources, environment, technology, and economy. High-level mineral geology technicians are cultivated for the demand of national economic construction, science and technology progress, and sustainable development. Based on geology, mathematics, technology, and economy, this discipline takes advantage of big data science and comprehensively applies the fundamental geological and mineral-geological survey methods and earth exploration technology, to study the geological background, conditions, and mechanisms of mineral resources formation, to explore and understand the temporal and spatial distribution of mineral deposits, and to conduct effective exploration and evaluation of mineral resources.</p> <p>Areas of active research include oil and gas geology, coal and coal-bed methane geology, petroleum field exploration, unconventional energy development geology and engineering, exploration, evaluation and development of solid mineral resources, big data mining and quantitative geological information, smart mines and four-dimensional control, etc.</p> <p>Features and advantages: traditional geosciences are integrated with information technologies such as big data mining and intelligent decision.</p> <p>该方向是以各类固体矿产和流体矿产为研究对象，以矿产资源</p>

<p>Research Direction 研究方向</p>	<p>Research Contents 研究内容</p>
	<p>勘查、评价、预测及开发利用的理论、技术和方法为研究内容，在现代地球系统科学理论指导下，以地质、资源、环境、技术、经济综合效益最优化为研究目标，为国家经济建设、科技进步和可持续发展培养高层次的矿产地质技术人才。学科以地质、数理、技术、经济为基础，基于地学大数据，综合运用基础地质和矿产地质调查方法、地球探测技术，研究矿产资源形成的地质背景、条件和机理，探索和认知矿产时空分布的规律性，开展科学有效的矿产资源勘查和评价。主要研究领域包括：石油与天然气地质、煤与煤层气地质、油气田勘探理论与方法、非常规能源开发地质与工程、固体矿产资源勘查评价与开发、大数据挖掘与定量地学信息、智能矿山与四维管控等。特色与优势：地学大数据挖掘与智能决策等信息技术与传统的地学相交叉。</p>
<p>2.Geo-exploration and Information Technology 地球探测与信息 技术</p>	<p>Research in this discipline applies related theories, such as technology and methods in geophysics, remote sensing, and mathematical geology, to study the structure, composition, solid and fluid resources of the earth's surface and interior. Through data processing, analysis and interpretation, the qualitative and quantitative evaluations are carried out to provide information for mineral resource exploration, hydrogeology, engineering geology, environmental and fundamental geological surveys, and geological disaster prevention and control.</p> <p>Areas of active research include gravity and magnetic prospecting, electrical prospecting, seismic prospecting, nuclear geophysics, geophysical logging, comprehensive geophysical prospecting, mathematical geology, remote sensing geology, mineral resource evaluation, geological process simulation, etc.</p> <p>Features and advantages: diverse subjects such as gravity and magnetic exploration, electrical exploration, seismic exploration, nuclear geophysics, and geophysical logging are mutually developed, and each subject is deeply integrated with geology.</p> <p>本方向利用地球物理、遥感地质和数学地质相关理论、技术与方法，研究地球表面及其内部构造、结构与组分、固体和流体矿产资源等信息。通过资料处理、分析与解释，进行定性和定量评价，为矿产资源勘查、水文地质、工程地质、环境及基础地质调查、地质灾害防治等提供探测信息。主要研究领域包括：重磁勘探、电法勘探、地震勘探、核地球物理、地球物理测井、综合地球物理勘探、数学地质、遥感地质、矿产资源评价、地质过程模拟等。特色与优势：重磁勘探、电法勘探、地震勘探、核地球物理、地球物理测井学科分支发展均衡；各学科分支与地质学相交叉融合充分。</p>

Research Direction 研究方向	Research Contents 研究内容
3.Remote Sensing of Resources and Environment 资源与环境遥感	<p>Taking geophysical resource and environment as the research object, the research in this discipline is based on the theories, technology, and methods of geosciences, and applies high-resolution hyperspectral remote sensing data to carry out intelligent monitoring, digitization, quantification and spatial intelligent prediction of multi-scale, multi-dimensional and multi-temporal resource, environment, and disaster issues.</p> <p>Areas of active research include integrated space-atmosphere-earth remote sensing technology, remote sensing image and data processing, and remote sensing analysis, prediction, dynamic monitoring, and evaluation in the field of earth sciences; remote sensing and cartography analysis of the moon and other planets (e.g. Mars).</p> <p>Features and advantages: remote sensing quantitative analysis, temporal-spatial series analysis, quantitative prediction and evaluation of comprehensive information.</p> <p>本方向以地球科学理论、技术、方法为基础，以地质资源与地质环境为研究对象，利用高分辨率高光谱遥感数据开展多尺度多维多时相资源环境与灾害等方面的智能监测、数字化与量化分析和空间智能预测研究。主要研究领域：地球科学领域的天-空-地一体化遥感技术、遥感图像数据处理、遥感地质分析与预测、动态监测与评价；月球与火星等行星探测与制图分析等。特色与优势：遥感定量分析、时空系列分析、综合信息定量预测与评价。</p>

三、Study Period and Credit Requirement 学习年限与学分要求

The length of study for doctoral students in China is generally 4 years, the maximum of study period is 6 years, and the credits should be no less than 21. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for Master student and Ph.D. student are interconnected, and in general each credit is equivalent to 16 class hours.

来华留学博士研究生学制4年，最长学习年限6年，不少于21学分。课程设置包括公共学位课、专业必修课、专业选修课及必修环节。研究生课程采取硕博打通模式，一般每学分对应16课内学时。

四、Curriculum Settings 课程设置

Course Type 课程类别	Course Number 课程编号	Course Name 课程名称	Hours 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
Public Courses 公共学位课	X21504001	Chinese Language 汉语	80	5	Autumn 秋季	——	
	X21504003	General Introduction of China 中国概况	32	2		——	
	X21504004	HSK level 3 HSK 三级	16	1		——	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1			
Compulsory Courses 专业学位课	X21504006	Review of Scientific Literature 科技文献综述	48	3			
	B21301017	Progress in Earth Sciences 地球科学进展	48	3	Autumn 秋季	School of Earth Sciences and Resources 地球科学与资源学院	Core and Compulsory 核心课程 必选
Optional Courses 专业选修课	B21301038	Mineral systems and exploration 成矿系统与找矿预测	32	2	Spring 春季	School of Earth Sciences and Resources, Choose 1of 2 courses 地球科学与资源学院 2 选 1	≥2 credits 不少于 2 学分
	B21301039	Remote Sensing and Geographic Information System 遥感与地理信息系统	32	2	Autumn 秋季		
	S21310046	Petroleum geology frontier 石油地质学前沿	32	2		School of Energy Resources, Choose 1of 2 Courses 能源学院 2 选 1	
	S21306001	Progress in unconventional energy exploration and development 非常规油气勘探与开发进展	48	3			
	X21310001	Electrical Exploration 电法勘探	32	2		School of Geophysics and	

Course Type 课程类别	Course Number 课程编号	Course Name 课程名称	Hours 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
	X21310002	Fundamentals of Geophysics 地球物理基础	32	2		Information Technology, Choose 1 of 5 Courses 地球探测与信息技术学, 5选1	
	X21310003	Gravity and Magnetic Exploration 重磁勘探	32	2			
	X21310004	Rock Physics 岩石物理	32	2			
	X21310005	Seismic Exploration 地震勘探	32	2			
	X21302005	Mechanical innovative design theory 机械创新设计理论	32	2		School of Engineering and Technology Choose 1 of 3 Courses 工程学院3选1	
	X21302006	Engineering geology 工程地质学	32	2			
	X21302002	Geohazard prediction and prevention 地质灾害预测与防治	32	2			
	X21305005	Numerical Methods in Geotechnics 岩土工程数值模拟方法	16	1	Autumn	School of Water Resources and Environment, Choose 1 or 2 of 5 Courses, ≥2 credits 水环学院, 5选2或1, 学分≥2	
	X21305003	Hydrogeochemical processes and PHREEQC modeling 水文地球化学过程与 PHREEQC 模拟	32	2	Autumn		
	B21305001	Advances in Water Resources and Environment 水资源与环境研究进展	32	2	Autumn		
	X21305001	Remediation of Groundwater Pollution 地下水污染修复	16	1	Autumn		

Course Type 课程类别	Course Number 课程编号	Course Name 课程名称	Hours 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
	X21305002	Uncertainty Analysis for Groundwater Flow Modeling 地下水模拟不确定性分析	16	1	Autumn		
	X21314001	Taijiquan(24-forms) 24式简化太极拳	16	1		Department of P. E. 体育部	
Compulsory Parts 必修环节	Basic Practice of Chinese 汉语基础实践			1	Autumn	—	
	Chinese Professional application 汉语专业应用			2	Summer	—	
	Dissertation Proposal 论文开题报告						具体要求见《中国地质大学(北京)研究生学位论文开题暂行管理办法》
	Dissertation Progress Report 论文中期报告						具体要求见《中国地质大学(北京)研究生中期考核实施办法》
	Academic Presentation 作学术报告						≥1 presentation at academic conferences 参加国内外学术会议, 至少作报告1次
	Pre-oral defense 预答辩						

Remarks: Public Courses are offered by International Cooperation and Exchange Office.

备注：公共学位课、必修环节中 Basic Practice of Chinese 汉语基础实践、Chinese Professional application 汉语专业应用由国际合作与交流处统一开设。

五、Catalogue of Classic Works and Professional Academic Journals for Reading 推荐

阅读经典著作和专业学术期刊目录

- 1.AAPG Bulletin
- 2.Basin research
- 3.Bulletin of Engineering Geology and the Environment
- 4.Canadian Geotechnical Journal
- 5.Computers & Geosciences
- 6.Computers and Geotechnics
- 7.EARTH SURFACE PROCESSES AND LANDFORMS
- 8.Earthquake Engineering and Structural Dynamics
- 9.Earth-Science Reviews
- 10.Energy and Fuels
- 11.Engineering and Mining Journal
- 12.Engineering Geology
- 13.Fuel
- 14.Geochemistry, Geophysics, Geosystems
- 15.Geochemistry: Exploration-Environment-Analysis
- 16.Geochemica et CosmochimicaActa
- 17.GeoDrilling International
- 18.Geological journal
- 19.Geology
- 20.Geophysical Journal International
- 21.Geophysical Prospecting
- 22.Geophysical Research Letters
- 23.Geophysics
- 24.Geophysics, Society of Exploration Geophysicists(SEG)
- 25.Geoscience Frontiers
- 26.Geotechnical Engineering, Proceedings of ICE
- 27.Geotechnical Testing Journal
- 28.Geotechnique
- 29.Ground Improvement
- 30.International geology review
- 31.INTERNATIONAL JOURNAL OF COAL GEOLOGY
- 32.International Journal of Rock Mechanics And Mining Science
- 33.Journal of Applied Geophysics
- 34.Journal of Asian earth sciences
- 35.Journal of Geochemical Exploration
- 36.Journal of Geophysical Research, American Geophysical Union(AGU)
- 37.Journal of Petroleum Geology

38. Journal of Petroleum Sciences and Engineering
39. JOURNAL OF PETROLEUM TECHNOLOGY
40. Journal of Sedimentary geology
41. JOURNAL OF THE GEOLOGICAL SOCIETY
42. Marine and Petroleum Geology
43. MARINE GEOLOGY
44. Mathematical Geosciences
45. Mathematical Geosciences
46. Mineral Resource Estimation
47. Natural Resources Research
48. Near Surface Geophysics, European Association of Geoscientists and Engineers(EAGE)
49. ORGANIC GEOCHEMISTRY
50. Pure and Applied Geophysics, Springer
51. Reviews of Geophysics, American Geophysical Union(AGU)
52. Rock Mechanics and Rock Engineering
53. Sedimentology
54. SPE DRILLING & COMPLETION
55. SPE JOURNAL
56. Surveys in Geophysics, Springer
57. Tectonics
58. TUNNELLING AND UNDERGROUND SPACE TECHNOLOGY
59. Acta Sedimentology
60. Metallogenic Law and Metallogenic Prediction
61. Metallogenic dynamics background, process and quantification and evaluation of large and super large deposits
62. Earth Science
63. Introduction to Geophysical Prospecting
64. Journal of Geophysics
65. Progress in Geophysics
66. Journal of Earth Sciences
67. Underground Engineering and Tunnel
68. The Frontier of Earth Science
69. Journal of Geomechanics
70. Geological Review
71. Acta Geology
72. Quantitative Geoscience Methods and Application
73. Introduction to Non-traditional Mineral Resources
74. Trenchless technology
75. Advanced Soil Mechanics

76. Journal of Engineering Geology
77. Journal of Engineering Geology
78. Journal of Palaeogeography
79. Diamond Drilling Manual
80. Exploration Geochemistry
81. Theories and Methods of Prospecting Prediction in Prospecting Areas
82. Science Bulletin
83. Theory and Method of Mineral Exploration
84. Quantitative Evaluation of Mineral Resources-A Comprehensive Method
85. Deposit Geology
86. Mineral Deposit Statistics Forecast
87. Coal Science and Technology
88. Journal of China Coal Society
89. Petroleum Exploration and Development
90. Acta Petrolei Sinica
91. Oil and Gas Geology
92. World Prospecting Model and Mineral Exploration
93. Mathematical Modeling Method and Its Application
94. Hydrogeology and Engineering Geology
95. Prospecting Engineering (Rock and Soil Drilling and Tunneling Engineering)
96. Natural Gas Industry
97. Geophysical and Geochemical Exploration
98. Xinjiang Petroleum Geology
99. Chinese Journal of Rock Mechanics and Engineering
100. Acta Petrologica Sinica
101. Chinese Journal of Geotechnical Engineering
102. Rock and Soil Mechanics
103. Lithologic Oil and Gas Reservoirs
104. Journal of Remote Sensing
105. Research on effective methods and approaches for rapid evaluation of concealed deposits (body) prospecting prospects
106. Geology of China
107. Formation mechanism and structural characteristics of metal mineralization series in China
108. Science in China
109. New Technology and New Evaluation Model of China's Mineral Resources Evaluation
110. Journal of China University of Mining & Technology
111. Journal of China University of Petroleum
112. Theories and Methods of Comprehensive Information Mineral Prediction

113. "111" Mind Introducing Plan (Liu Jiajun, etc.) Mineral Deposit Exploration Model (Famous Teacher Lecture Series Textbook and Reference) 2009-2017.
114. Research on effective methods and approaches for rapid evaluation of concealed deposits (body) prospecting prospects
115. Formation mechanism and structural characteristics of metal mineralization series in China
116. Metallogenic Law and Metallogenic Prediction
117. Comprehensive information mineral forecast theory and method
118. New Technology and New Evaluation Model of China's Mineral Resources Evaluation
119. Exploration Geochemistry
120. Mathematical Modeling Method and Its Application
121. Quantitative Evaluation of Mineral Resources-A Comprehensive Method
122. Theories and Methods of Prospecting Prediction in Prospecting Areas
123. Introduction to Geophysical Prospecting

(0820) Oil and Gas Engineering Training Program for International Doctoral Student

(0820) 石油与天然气工程 博士留学生 培养方案

一、Training Goal 培养目标

Through the training, the international students should have a good knowledge of Chinese culture and national conditions. The students should adopt a friendly political stance toward China, respect Chinese social morality and customs. In addition, being law-abiding, honest, trustworthy, physical, and mental health, having good academic ethics and professional dedication, and rigorous style of study are required. The international students are also encouraged to keep pace with the scientific and technological progress and social development, handle the basically skill and method for conducting research, and can make innovative achievements in oil and gas engineering. The ability of independently conducting research and the skills of organizing and implementing academic projects in oil/gas field development geology, theory and technology of oil/gas drilling and production, and theory and method of oil/gas development, etc, will be cultivated. After graduation, the international students should have the ability to communicate using Chinese and read the professional materials that are written in Chinese.

了解中国文化和基本国情，坚持对我国友好的政治立场，尊重中国的社会公德和风俗习惯，遵纪守法，品行端正，诚实守信，身心健康，具有良好的科研道德，敬业精神以及严谨的学风。适应科技进步和社会发展需要，掌握科学研究的技能和方法，能在石油与天然气工程相关领域或专门技术上做出创新性成果。具有独立从事油气田开发地质、油气钻采理论与技术、油气开发理论与方法等方向科学研究的能力和组织实施科研项目的素质。汉语水平要求具有使用生活用语和阅读本专业汉语资料的能力。

二、Research Direction 研究方向

Research Direction 研究方向	Research Content 研究内容
1. Oil/Gas Field Development Geology 油气田开发地质	This research field includes high-resolution sequence stratigraphy, sedimentary microfacies, identification and classification of reservoir types, reservoir characterization, reservoir structure and flow units, geological modeling of oil and gas reservoirs and evaluation of residual oil and gas distribution. 该方向研究领域主要包括高分辨率层序地层学、沉积微相、油气藏类型识别与划分、储层表征、储层构型和流动单元、油气藏地质建模以及剩余油气分布评价等。

Research Direction 研究方向	Research Content 研究内容
<p>2. Theory and technology of oil/gas drilling and production 油气钻采理论与技术</p>	<p>This research fields includes drilling rock mechanics, multiphase flow in wellbore, wellbore trajectory design, theory and technology of monitoring while drilling in complicated structure wells, production test, production technology design, stimulation stragies, well completion and reservoir protection, etc. 该方向研究领域主要包括油气井钻井岩石力学、井筒多相流动、井眼轨迹设计、复杂结构井随钻监测理论与技术、试油试采、采油工艺设计、油气井增产措施、完井与储层保护等。</p>
<p>3. Theory and method of oil/gas development 油气开发理论与方法</p>	<p>This research field includes conventional/unconventional/ deep reservoir development, multiphase flow of low-permeability and high-water-cut gas reservoirs, digital core reconstruction, modern well test theory and method, numerical simulation of oil and gas reservoirs, reservoir production analysis, reservoir development adjustment, geotherm and gas hydrate development, etc. 该方向研究领域主要包括常规/非常规/深层油气藏开发、低渗透及高含水油气藏多相渗流理论、数字岩心重构、现代试井理论与方法、油气藏数值模拟、油藏动态分析、油气藏开发调整、地热及天然气水合物资源开发等理论与方法的攻关研究。</p>
<p>4. Oilfield chemistry and EOR technology 油田化学与提高采收率技术</p>	<p>This research field includes intelligent water development by chemical flooding, Nanometer techniques in oil production, wettability reversal of oil and gas reservoirs, chemical control method and technology of dominant channel, unconventional fracturing and energizing development, multi-medium compound flooding theory and method, heavy oil thermal recovery and chemical viscosity-reduction, microbial enhanced oil recovery theory, etc. 该方向主要研究领域包括化学驱智能水开发、油气藏纳米采油与润湿反转、优势通道化学调控方法与工艺、非常规压裂增能开发、多介质复合驱油理论与方法、稠油热采及化学降粘、微生物采油理论方法等。</p>
<p>5. Theory and method of artificial intelligence for oil/gas field development 油气田开发人工智能理论与方法</p>	<p>This research field includes big data theory and method in oil/gas field, oil and gas field development with intelligent optimization theory and method, intelligent numerical simulation technology and oil field intelligent production control technology, providing theoretical and technical support for artificial intelligence of oil and gas field development. 该方向主要研究领域包括油气田大数据理论与方法、油气田开发智能优化理论与方法、智能数值模拟技术、油田智能化生产操控技术等研究，为油气田开发的人工智能化提供理论基础与技术支持。</p>

三、Study Period and Credit Requirement 学习年限与学分要求

The length of study for doctoral students in China is generally 4 years, the maximum of study period is 6 years, and the credits should be no less than 21. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for postgraduate students and Ph.D. students are interconnected, and in general each credit is equivalent to 16 class hours.

来华留学博士研究生学制 4 年，最长学习年限 6 年，不少于 21 学分。课程设置包括公共学位课、专业必修课、专业选修课及必修环节。研究生课程采取硕博打通模式，一般每学分对应 16 课内学时。

四、Curriculum Settings 课程设置

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
Public Courses 公共学位课	X21504001	Chinese Language 汉语	80	5	Autumn	—	
	X21504003	General Introduction of China 中国概况	32	2		—	
	X21504004	HSK level 3 HSK 三级	16	1		—	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1		—	
Compulsory Courses 专业学位课	X21504006	Review of Scientific Literature 科技文献综述	48	3			
	X21301001	Progress in Earth Science 地球科学进展	48	3			
Optional Courses 专业选修课	X21306001	Advances in Oil and Gas Field Development 油气田开发科技进展	48	3			≥2 credits 不少于 2 学分

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开 课单位	Remarks 备注
	X21314001	Taijiquan(24-forms) 24 式简化太极拳	16	1		Department of P. E. 体育部	
Compulsory Parts 必修环节	Basic Practice of Chinese 汉语 基础实践			1	Autumn	——	
	Chinese Professional application 汉语专业应用			2	Summer	——	
	Thesis Opening Report 论文开题报告			——			
	Interim Report 论文中期报告			——			
	Academic report delivery 作学 术报告			——			
	Pre-oral defense 预答辩			——			

Remarks: Public Courses are offered by International Cooperation and Exchange Office.

备注：公共学位课、必修环节中 Basic Practice of Chinese 汉语基础实践、Chinese Professional application 汉语专业应用由国际合作与交流处统一开设。

五、Catalogue of Classic Works and Professional Academic Journals for Reading 推荐阅读经典著作和专业学术期刊目录

1. Petrophysics, Djebbar Tiab、 Erle C.Donaldson, 2004
2. The flow of homogeneous fluids through porous media, M.Muskat, 1946
3. Flow of fluids through porous materials, Royal Eugene Collins, 1961
4. Wells test analysis, Raghavan, Rajagopal , 1993
5. Gas Reservoir Engineering, John Lee, Robert & A.Wattenbarger, 1996
6. Advance Reservoir Engineering, Tarek Ahmed、 Paul D.McKinney, 2005
7. Fundamentals of numerical reservoir simulation, Donald W. Peaceman, 1977
8. Petroleum reservoir simulation, Khalid Aziz, 1979
9. Reservoir simulation, Robert L. Dalton, 1990
10. Integrated flow modeling, John R.Fanchi, 2000
11. Applied reservoir simulation, Turgay Ertekin et al., 2001
12. Shared Earth modeling-Methodologies for integrated reservoir simulations, John R.Fanchi, 2002

13. Enhanced Oil Recovery. Don W. Green. Henry L. Doherty Memorial Fund of AIMS Society of Petroleum Engineers
14. Chemical Enhanced Oil Recovery (cEOR) - a Practical Overview. World's largest Science, Technology & Medicine Open Access book publisher
15. Modern Chemical Enhanced Oil Recovery Theory and Practice, James J. Sheng. ISBN 978-1-85617-745-0, 2011 Gulf Professional Publishing (ELSEVIR)
16. Enhanced Oil Recovery Field Case Studies. James J. Sheng, Ph. D. Gulf Professional Publishing (ELSEVIR)
17. Petroleum Engineer's Guide to Oil Field Chemicals and Fluids, Johannes Karl Fink. ISBN: 978-0-12-383844-5, 2011 Gulf Professional Publishing(ELSEVIR)
18. SPE Journal
19. Journal of Petroleum Science and Engineering
20. Journal of Natural Gas Science and Engineering
21. 石油勘探与开发
22. 石油学报
23. 石油科学
24. 天然气工业
25. 中国石油大学学报.自然科学版
26. 石油钻采工艺
27. 油田化学
28. 新疆石油地质
29. 西南石油大学学报
30. 大庆石油地质与开发
31. 西安石油大学学报
32. 油气地质与采收率
33. 天然气地球科学
34. 断块油气田
35. 特种油气藏
36. 大庆石油地质与开发
37. 中国海上油气
38. 石油钻探技术
39. 岩性油气藏
40. 钻井液与完井液

(0830) Environmental Science and Engineering Training Program for International Doctoral Student

(0830) 环境科学与工程 博士留学生 培养方案

一、Training Goal 培养目标

Taking morality as the foundation and fostering people as the foundation, adhering to the principle of all-round development of morality, intelligence, Physique and beauty, cultivating people with lofty ideological qualities, friendly political stand to our country, rigorous academic attitude, realistic and innovative spirit, and good professional ethics, having good international communication and environmental management and leadership skills, meeting the needs of the international job market, having scientific literacy in Environmental Science and Engineering, solid basic theory and broad professional knowledge, strong ability to solve practical problems, able to independently undertake the management of scientific research, teaching and production technology in international organizations, government administrations, scientific research and education institutions and related fields.

以立德树人为根本，坚持德、智、体、美全面发展方针，培养具有高尚的思想品质，对我国友好的政治立场，严谨的治学态度，求实的创新精神，良好的职业道德，具备良好的国际交流能力和环境管理与领导能力，符合国际就业市场需求，具有从事环境科学与工程工作的科学素养，坚实的基础理论和宽广的专业知识，较强的解决实际问题的能力，能够在国际组织、各国政府管理部门、科研教育机构及相关领域独立承担科学研究、教学和生产技术管理工作的高层次国际化人才。

二、Research Direction 研究方向

Research Direction 研究方向	Research Content 研究内容
1. Environmental Science 环境科学	<p>Based on the traditional natural sciences and the humanities and social sciences, environmental science is an interdisciplinary and comprehensive discipline which studies the interaction between human and the environment, The research interests include environmental chemistry, environmental ecology, environmental biology, environmental geography, environmental management, environmental economics, environmental law and environmental policy.</p> <p>环境科学是基于传统自然科学和人文社会科学研究人与环境相互作用及其调控的综合性交叉学科，主要研究内容包括环境化学、环境生态学、环境生物学、环境地学、环境管理学、环境经济学、环境法学和环境政策学等。</p>

Research Direction 研究方向	Research Content 研究内容
2. Environmental Engineering 环境工程	<p>Using physical, chemical, biological and ecological methods, environmental engineering focuses on preventing, controlling and remediating various kinds of environmental pollutants. The research interests include the prevention and remediation of air pollution, water pollution and soil pollution, solid waste disposal and resources, as well as noise, radioactive materials, light, heat, electromagnetic wave and other physical pollution prevention and control technology and engineering measures.</p> <p>环境工程关注采用物理、化学、生物和生态等方法对各类环境污染物进行综合防治，主要研究内容包括大气污染、水污染和土壤污染的防治和修复，固体废物处置与资源化，以及噪声、放射性物质、光、热、电磁波等物理性污染防治技术和工程措施等。</p>

三、Study Period and Credit Requirement 学习年限与学分要求

The length of study for doctoral students in China is generally 4 years, the maximum of study period is 6 years, and the credits should be no less than 21. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for postgraduate students and Ph.D. students are interconnected, and in general each credit is equivalent to 16 class hours.

来华留学博士研究生学制 4 年，最长学习年限 6 年，不少于 21 学分。课程设置包括公共学位课、专业必修课、专业选修课及必修环节。研究生课程采取硕博打通模式，一般每学分对应 16 课内学时。

四、Curriculum Settings 课程设置

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
Public Courses 公共学位课	X21504001	Chinese Language 汉语	80	5	Autumn	—	
	X21504003	General Introduction of China 中国概况	32	2		—	
	X21504004	HSK level 3 HSK 三级	16	1		—	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1		—	
Compulsory Courses 专业	X21504006	Review of Scientific Literature 科技文献综述	48	3			

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
学位课	X21301001	Progress in Earth Science 地球科学进展	48	3			
Optional Courses 专业选修课	B21305001	Advances in Water Resources and Environment 水资源与环境研究进展	32	2	Autumn	School of Water Resources and Environment 水资源与环境学院	≥2 credits 不少于2学分
	X21305003	Hydrogeochemical processes and PHREEQC modeling 水文地球化学过程与 PHREEQC 模拟	32	2	Autumn	School of Water Resources and Environment 水资源与环境学院	
	X21314001	Taijiquan(24-forms) 24 式简化太极拳	16	1		Department of P. E. 体育部	
Compulsory Parts 必修环节	Basic Practice of Chinese 汉语基础实践			1	Autumn	——	
	Chinese Professional application 汉语专业应用			2	Summer	——	
	Thesis Opening Report 论文开题报告			——			
	Interim Report 论文中期报告			——			
	Academic report delivery 作学术报告			——			
	Pre-oral defense 预答辩			——			

Remarks: Public Courses are offered by International Cooperation and Exchange Office.

备注: 公共学位课、必修环节中 Basic Practice of Chinese 汉语基础实践、Chinese Professional application 汉语专业应用由国际合作与交流处统一开设。

五、Catalogue of Classic Works and Professional Academic Journals for Reading 推荐阅读经典著作和专业学术期刊目录

1. Applied Environment Microbiology, American Society for Microbiology
2. Applied Geochemistry, Elsevier
3. Biogeochemistry, Elsevier
4. Bioresource Technology, Elsevier
5. Chemical Engineering Journal, Elsevier

6. Chemosphere, Elsevier
7. Ecotoxicology and Environmental Safety, Elsevier
8. Electrochimica Acta, Elsevier
9. Environmental Conservation, Elsevier
10. Environmental Pollution, Elsevier
11. Environmental Science & Policy, Elsevier
12. Environmental Science & Technology, American Chemical Society
13. Environmental Toxicology, Elsevier
14. Geochimica et Cosmochimica Acta, Elsevier
15. Geomicrobiology Journal, Elsevier
16. Ground Water, Elsevier
17. Journal of Colloid and Interface Science, Elsevier
18. Journal of Contaminant Hydrology, Elsevier
19. Journal of Hazardous Materials, Elsevier
20. Nature, Nature Group
21. Nature Communications, Nature Group
22. Science of the Total Environment, Elsevier
23. Soil Biology and Biochemistry, Elsevier
24. Water Research, Elsevier
25. Water Resource Research, American Geophysical Union
26. 地球科学, 中国地质大学 (武汉)
27. 地学前缘, 中国地质大学 (北京)
28. 环境工程学报, CNKI
29. 环境化学, CNKI
30. 环境科学, CNKI
31. 环境科学学报, CNKI
32. 环境科学研究, CNKI
33. 环境科学与技术, CNKI
34. 科学通报, 中国科学院
35. 农业环境科学学报, CNKI
36. 气候与环境研究, CNKI
37. 生态学报, CNKI
38. 生态学杂志, CNKI
39. 水处理技术, CNKI

40. 水科学进展, CNKI
41. 水文地质工程地质, 中国地调局
42. 土壤学报, CNKI
43. 微生物学报, CNKI
44. 应用生态学报, CNKI
45. 中国环境科学, CNKI
46. 中国科学(D辑), 中国科学院地理所
47. 中国农业科学, CNKI
48. 中国人口资源与环境, CNKI
49. 中国生态农业学报, CNKI
50. 自然资源学报, CNKI

(1201) Management Science and Engineering Training Program for International Doctoral Student

(1201) 管理科学与工程 博士留学生培养方案

一、Training Goal 培养目标

To cultivate high-level research talents with innovative spirit who master the frontier theories and methods of the discipline, have the ability of carrying out research independently, have a rigorous style of work, good spiritual civilization and comprehensive quality, and adapt to the needs of social and economy development. 1. Have good ideological quality and moral quality, rigorous realistic scientific attitude and innovative consciousness, love the motherland, law-abiding, rigorous academic professional quality and humanistic quality; 2. Master the solid and broad theoretical basis and systematic and in-depth professional knowledge of the discipline, master the development trend and academic frontier of the discipline, skillfully use the theories and methods of modern management science and engineering, and master the theories of systems engineering, management and economics; 3. Familiar with computer and modern network technology; 4. Master 1-2 foreign languages, be able to conduct international academic exchanges in foreign languages, read foreign literature and materials skillfully, and have a thorough and comprehensive understanding of the current situation, frontier and development trend of the discipline at home and abroad; 5. Independently engage in scientific research on basic theories and cutting-edge topics of the discipline, and be able to make innovative research results; 6. Innovative talents who are qualified for teaching and scientific research and all kinds of high-level management work in institutions of higher learning, enterprises and government management departments, and have the ability to independently carry out management scientific research.

培养掌握本学科前沿理论方法，具备独立开展研究能力，具有严谨作风和良好精神文明素养及综合素质，适应社会经济发展需求，德、智、体全面发展，极富创新精神的高层次研究型人才。1.具有良好思想品质和道德素质、有严谨求实科学态度和创新意识、热爱祖国、遵纪守法、治学严谨的专业素养和人文素养；2.掌握本学科坚实宽广的理论基础及系统深入的专业知识，掌握本学科发展趋势及学术前沿，熟练利用现代管理科学与工程的理论方法，精通系统工程、管理学和经济学理论；3.熟练使用计算机及现代网络技术；4.掌握 1-2 门外语，能够用外语进行国际学术交流，熟练阅读外文文献资料，对本学科国内外现状、前沿和发展趋势有深入全面的了解；5.独立从事本学科基础理论及前沿课题的科学研究，并能够做出创新性研究成果；6.胜任高等院校、企业、政府管理部门的教学科研工作和各类高层次管理工作，具备独立开展管理科学研究能力的创新

型人才。

二、Research Directions 研究方向

Research Direction 研究方向	Research Content 研究内容
<p>1. System Simulation and Optimization Decision 系统模拟与优化决策</p>	<p>Guided by the theory of system science, this direction analyzes the constituent elements, influencing factors and their interaction of systems such as country, industry, enterprise, or city. Through simulation and emulation, the internal structure and operation law are analyzed, and optimization theories and methods are studied from system evaluation and prediction, system structure evolution, resource integration and allocation, multi-agent interaction mechanism, management mechanism and system, etc., providing decision-making methods and theoretical guidance for managers of governments and enterprises at all levels.</p> <p>该方向以系统科学的理论为指导，对国家、行业或产业、企业或者城市等系统的构成要素、影响因素及其相互作用关系进行分析，通过模拟和仿真，对其内在结构、运行规律进行分析，从系统评价与预测、系统结构演变、资源整合与配置、多主体交互机制、管理机制和体系等方面进行优化理论和方法的研究，为各级政府、企业等的管理者提供决策方法和理论指导。</p>
<p>2. Resource Management Engineering 资源管理工程</p>	<p>This direction is guided by resource economic management theories such as resource allocation, resource environmental compensation, and combines economics, management science and engineering theory and methods. It studies important resources such as mineral resources and energy, resource-based cities, and regional-watershed ecological environment from the aspects of relevant policies and implementation effects, improvement of modern mining management capacity, technical guidelines for resource development and utilization under the background of carbon neutrality, restoration of abandoned industrial and mining lands and introduction of social funds. This provides theoretical and practical guidance for the transformation and development of resource-based cities, regional/watershed ecological restoration management, coastal zone functional zoning and management, national park management and resource environmental protection.</p> <p>该方向以资源配置资源环境补偿等资源经济管理理论为指导，将经济学、管理科学与工程理论方法相结合，以矿产、能源等重要矿产资源，资源型城市，区域—流域生态环境为研究对象，以及相关政策与实施效果、矿业现代治理能力提升、碳中和背景下资源开发利用技术指引、工矿废弃地修复与社会资金引入等方面进行研究，为资源型城市转型与发展、区域性/流域性生态修复管理、海岸带功能区划与管理、国家公园管理与资源环境保护等提供理论与实践指导。</p>

Research Direction 研究方向	Research Content 研究内容
<p>3. Complex System Management 复杂系统管理</p>	<p>This direction conducts research on all kinds of complex social and economic systems under the guidance of interdisciplinary theories and methods such as complexity science theory, economics theory, management theory, systems science theory, information technology and methods. It reveals the complex behavior mechanism and rules of the system through modeling and analysis, and then provides theoretical guidance for the management of various complex social and economic systems. It emphasizes systematizations, non-linearity, emergence, self-organization and self-similarity in complex system management.</p> <p>该方向以复杂性科学理论、经济学理论、管理学理论、系统科学理论、信息技术及方法等交叉学科理论和方法为指导，对各类复杂社会经济系统进行研究，通过建模与分析，揭示其复杂行为机制和规律，进而为各类复杂社会经济系统管理提供理论指导。强调复杂系统管理中的系统性、非线性、涌现、自组织、自相似等观点来处理复杂性问题。</p>
<p>4. Management Psychology and Behavioral Science 管理心理与行为</p>	<p>Guided by the theories of psychology and behavioral science, this direction reveals the laws of psychological activity, behavior generation and development of individuals, groups, and organizations in management activities through interviews, observation, psychological measurement, situational experiments, complex system modeling, data mining and machine learning, to realize scientific decision-making, optimize the management environment and improve management efficiency. The output of this direction could be used to societal governance, macro economy management, public management, organization management, corporate Management, human resources management, safety management, economical management and relative fields.</p> <p>该方向是以心理学和行为科学的理论为指导，通过访谈、观察、心理测量、情景实验、复杂系统建模、数据挖掘和机器学习等方法，揭示管理活动中的个体、群体和组织中人的心理活动与行为产生与发展的规律，以实现科学决策，优化管理环境，提高管理效能。该方向可用于社会治理、宏观管理、公共管理、应急管理、组织管理、企业管理、人事管理、安全管理、经济管理等相关领域。</p>
<p>5. Risk and Emergency Management 风险与应急管理</p>	<p>This direction is mainly guided by the theory of risk management, emergency management and crisis management, engaged in methods and applications of research in these fields, to provide emergency management programs and optimization, achieving multi-state random occurrence of real-time dynamic decision-making. Studying the induces of the risk, examining and predicting the risk, and responding to the risk and recovery learning after the risk, comprehensively evaluating the risk, ability, responses, communication, organization and society of the system, to control and reduce the risk and offer decision madding for the risk.</p>

Research Direction 研究方向	Research Content 研究内容
	该方向主要以风险管理、应急管理和危机管理的基本理论为指导，从事风险管理、应急管理和危机管理理论方法及应用方面的研究，提供应急管理方案及优化，实现多状态随机发生的实时动态决策。研究风险形成的诱因、对风险进行检测与预警、响应及事后恢复学习，对组织和系统的风险、能力、响应、沟通、体制、社会等方面进行综合评估，致力于控制并降低组织或系统风险，提供应急管理决策。

三、Study Period and Credit Requirement 学习年限与学分要求

The length of study for doctoral students in China is generally 4 years, the maximum of study period is 6 years, and the credits should be no less than 21. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for postgraduate students and Ph.D. students are interconnected, and in general each credit is equivalent to 16 class hours.

来华留学博士研究生学制4年，最长学习年限6年，不少于21学分。课程设置包括公共学位课、专业必修课、专业选修课及必修环节。研究生课程采取硕博打通模式，一般每学分对应16课内学时。

四、Curriculum Settings 课程设置

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
Public Courses 公共学位课	X21504001	Chinese Language 汉语	80	5	Autumn	—	
	X21504003	General Introduction of China 中国概况	32	2	Autumn	—	
	X21504004	HSK level 3 HSK 三级	16	1	Spring	—	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1	Spring	—	
Compulsory Courses 专业学位课	X21504006	Review of Scientific Literature 科技文献综述	48	3	Spring	School of economics and management 经济管理学院	

Course Type 课程类别	Course Numbers 课程编号	Course Name 课程名称	Periods 学时	Credits 学分	Semesters 开课学期	Department for Lecturing 开课单位	Remarks 备注
	X21301001	Progress in Earth Science 地球科学进展	48	3	Autumn	School of Earth Sciences and Resources 地球科学与资源学院	
Optional Courses 专业选修课	X21307008	Resource and Environmental Management 资源环境管理	32	2	Spring	School of economics and management 经济管理学院	≥2 credits 不少于2学分
	X21314001	Taijiquan(24-forms) 24式简化太极拳	16	1	Autumn	Department of P. E. 体育部	
Compulsory Parts 必修环节	Basic Practice of Chinese 汉语基础实践			1	Autumn	——	
	Chinese Professional application 汉语专业应用			2	Summer	——	
	Thesis Opening Report 论文开题报告			——			
	Interim Report 论文中期报告			——			
	Academic report delivery 作学术报告			——			
	Pre-oral defense 预答辩			——			

Remarks: Public Courses are offered by International Cooperation and Exchange Office.

备注：公共学位课、必修环节中 Basic Practice of Chinese 汉语基础实践、Chinese Professional application 汉语专业应用由国际合作与交流处统一开设。

五、Catalogue of Classic Works and Professional Academic Journals for Reading 推荐阅读经典著作和专业学术期刊目录

阅读经典著作和专业学术期刊目录

Catalogue of English Classic Works and Professional Academic Journals for Reading 英文推荐阅读经典著作和专业学术期刊目录	Catalogue of Chinese Classic Works and Professional Academic Journals for Reading 中文推荐阅读经典著作和专业学术期刊目录
[1] Management Science [2] Academy of Management Journal [3] Academy of Management Review [4] American Economic Review [5] MIS Quarterly	[1] Journal of Management Sciences in China 管理科学学报 [2] System Engineering-Theory & Practice 系统工程理论与实践 [3] Management World

[6] Operations Research	管理世界
[7] Journal of Operations Management	[4] Economic Research Journal
[8] Production and Operations Management	经济研究
[9] European Journal of Operational Research	[5] China Economic Quarterly
[10] Journal of Finance	经济学（季刊）
[11] Journal of Management Information Systems	[6] Journal of Quantitative & Technical Economics
[12] Academy of Management Annals	数理经济技术经济研究
[13] Econometrica	[7] China Soft Science
[14] Annals of Statistics	中国软科学
[15] Risk Analysis	[8] Journal of Financial Research
[16] Psychological Science	金融研究
[17] Annual Review of Psychology	[9] Chinese Journal of Management Science
[18] Journal of Applied Psychology	中国管理科学
[19] Environmental and Resource Economics	[10] Journal of Systems Engineering
[20] Ecological Economics	系统工程学报
	[11] Management Review
	管理评论
	[12] Management Science
	管理科学
	[13] Journal of Industrial Engineering and Engineering Management
	管理工程学报
	[14] Nankai Business Review
	南开管理评论
	[15] China Industrial Economics
	中国工业经济
	[16] Social Sciences in China
	中国社会科学
	[17] Statistical Research
	统计研究
	[18] Operations Research and Management Science
	运筹与管理
	[19] Journal of The China Society For Scientific and Technical Information
	情报学报
	[20] China Population Resources and Environment
	中国人口资源环境