China University of Geosciences, Beijing (CUGB)

中国地质大学（北京）

Training Program for International Master Student

来华留学硕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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CONTENTS 目录

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 oversea 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、社会发展中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 oversea 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			
							≥2 credits 不少于2学分
Major Optional Course 专业选修课							≥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。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 专业选修课							≥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	Thesis Opening Report 论文开题报告			——			

必修环节	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。

㈠ 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 Master Student

(0202) 应用经济学 硕士留学生 培养方案

一、Training Goal 培养目标

The cultivation of master students in this discipline emphasizes moral, intellectual and physical development, and requires students to love the motherland, support the leadership of the Party, abide by the law and discipline, and conduct themselves well. They should have a solid theoretical foundation, master systematic applied economics and relevant professional knowledge and discipline development trends. And can correctly use economics, mathematics, statistics and other research methods to solve the theoretical and practical problems in applied economics, independently engaged in scientific research, teaching or management work. Specific requirements :(1) possess high political and ideological quality, master scientific world outlook and methodology, develop morally, intellectually and physically in an all-round way, and become high-level professionals needed by socialist modernization. (2) Have solid basic theories and professional knowledge of economics, master scientific methodology, be able to conduct investigation and research, design schemes, build models and conduct empirical tests for real economic problems, and be able to independently engage in teaching, scientific research and management of the discipline. (3) Master a foreign language and have a high level of foreign language, can skillfully read the literature of the subject, have good listening and speaking ability.

本学科硕士生的培养强调德、智、体全面发展，要求学生热爱祖国，拥护党的领导，遵纪守法，品行端正，培养具有扎实的理论基础，掌握系统的应用经济学及相关方向的专业知识和学科发展动态，并能正确运用经济学、数学、统计学等研究方法解决应用经济学方面的有关理论和实际问题，独立从事科学研究、教学工作或管理工作的高级复合型人才。具体要求：（1）具有较高政治思想素质，掌握科学世界观与方法论，德智体全面发展，成为社会主义现代化建设需要的高层次专业人才。（2）具备扎实的经济学基础理论与专业知识，掌握科学的方法论，基本能够针对现实经济问题进行调查研究、设计方案、构建模型、实证检验，能够独立从事本学科的教学、科研和管理工作。（3）掌握一门外语并具有较高的外语水平，能熟练地阅读本学科的文献资料，具有较好的听说能力。

二、Research Directions 研究方向

Research Direction 研究方向	Research Content 研究内容
1.Industrial economics 产业经济学	This direction takes industrial activities in social economy as the main research object, and mainly applies relevant theories and research methods of industrial economics to carry out researches on industrial organization and industrial policy, input-output analysis, industrial transformation and upgrading and innovation, policy evaluation of comprehensive environmental and ecological governance, sustainable development of mining industry, industrial ecological economic efficiency and environmental policy and so on. 该方向以社会经济中的产业活动为主要研究对象，主要运用产业经济学的相关理论和研究方法开展包括产业组织与产业政策、投入产

	出分析、产业转型升级与创新、环境与生态综合治理政策评价、矿业可持续发展、产业生态经济效率与环境政策等方面的研究。
2.Regional economics 区域经济学	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。
3.International trade 国际贸易学	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。
4.Finance 金融学	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。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	
	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	32	2			
	X21307007	Resource and Environmental Economics 资源环境经济	32	2		School of Economics and Management 经济管理学院	≥2 credits 不少于 2 学分
	X21307004	International Finance Management 国际金融管理	32	2		School of Economics and Management 经济管理学院	
Optional Course 专业选修课	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	≥6 credits 不少于 6 学分
	X21307008	Resource and Environmental Management 资源环境管理	32	2		School of Economics and Management 经济管理学院	
	X21307005	Mining Finance 矿业金融	16	1		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	——	
	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：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.

(0403) Physical Education Training Program for International Master Student

(0403) 体育学 硕士留学生 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; Combination of theory and practice, guided by social needs, with basic quality training and technical application capabilities as the main line, mastering systematic and solid sports theory, possessing the knowledge and practical skills required in the fields of sports industry management, industrial management, education and training, etc. Efforts should be made to cultivate the theoretical and practical level of outdoor sports, to serve the development of national sports, and to have innovative spirit and practical ability "foundation, strong ability, high quality" research and application-oriented talents.

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；理论和实践相结合，以社会需求为导向，以基本素质培养和技术应用能力为主线，掌握系统扎实的体育理论，具有体育行业管理、产业经营、教育培训等领域所需知识技能与实践能力，着力培养户外运动方面的理论和实践水平，服务国家体育发展，具有创新精神和实践能力的“基础实、能力强、素质高”的研究和应用型人才。

二、Research Directions 研究方向

Research Direction 研究方向	Research Content 研究内容
1.Physical Education and Training 体育教育训练学	This direction is based on the modern education and teaching theory and the scientific theory of sports human body, studying the laws of physical education and sports training, and providing scientific guidance for the teaching, training, scientific research and management of many sports events such as ball games, track and field, gymnastics, etc. 该方向以现代教育教学理论和运动人体科学理论为基础，研究体育教育与运动训练的规律，为球类、田径、体操等诸多体育运动项目的教学、训练、科研与管理提供科学指导。
2.National Traditional Sports 民族传统体育学	This direction is based on Chinese martial arts, covering a comprehensive emerging discipline of Chinese folk sports and traditional sports health preservation. Promote cultural integration through the research of traditional national sports. 该方向以中国武术为主干，涵盖中华民族民间体育和传统体育养生的一门综合性新兴学科。通过对民族传统体育项目的研究，促进文化交融。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	
	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			
	SZ14003	Sports training 运动训练学	32	2	Autumn	Department of P. E. 体育部	≥2 credits 不少于 2 学分
Optional Course 专业选修课	SZ14004	Exercise Physiology 运动生理学	32	2	Autumn	Department of P. E. 体育部	≥6 credits 不少于 6 学分
	SX14005	Outdoor sports training theory and practice 户外运动训练理论与实践	32	2	Autumn	Department of P. E. 体育部	
	SX14009	Quality Extension Theory and Practice 素质扩展理论与实践	32	2	Autumn	Department of P. E. 体育部	

	S21314007	National traditional sports culture 民族传统体育文化	32	2	Spring	Department of P. E. 体育部	
	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	——	
	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：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.《Technical Skills for Adventure Programming》, Mark Wagstaf
2.《Wildermess and Rescue Medicine》, Jeffrey Isaac
3.《Outdoor Leadership : Theory and Practice》, Bruce Martin
4.《Outdoor Recreation : An Introduction》, Ryan Plummer
5.《Adventure Education : Theory and Applications》, Project Adventure
6.《Climbing Self Rescue : Improvising Solutions for Serious Situations》, Andy Tyson
7.《Altitude Ilness : Prevention and Treatment》, Steven Bezruchka
8.《Climbing : Training for Peak Performance》, Clyde Soles
9.《The Outdoor Athlete : Total Training for Outdoor Performance》, Steve Ilg
10.《Safety , Risk and Adventure in Outdoor Activities》, Bob Barton
11.《Sport Biomechanics》, Zaziolki et al
12.《体育运动心理学研究进展》,张力为、任未多
《Sports Psychology Research Progress》, Liwen Zhang, Weiduo Ren
13.《实用运动生理学》,杨锡让
《Practical Exercise Physiology》, Xirang Yang
14.《运动训练理论与方法》,图多-博姆帕
《Sports Training Theory and Methods》, Tudor-Boompa
15.《实用运动医学》,于长隆、曲绵域
《Practical Sports Medicine》, Changlong Yu, Mianyu Qu
16.《体育教学改革新视野》,毛振明

《New Vision of Physical Education Reform》, Zhenming Mao

17.《体育科学研究方法》,张力为

《Sports Research Methodology》, Liwen Zhang

18.《体育统计与 SPSS 》,王晓芬

《Sports Statistics and SPSS》, Xiaofen Wang

二、Professional Academic Journals 学术期刊：

1. 《体育科学》,国家体有总局

《Sports Science》, General Administration of State Sports of China

2.《天津体育学院学报》,天津体育学院

《Journal of Tianjin Institute of Physical Education》, Tianjin Institute of Physical Education

3.《上海体育学院学报》,上海体育学院

《Journal of Shanghai University of Sport》, Shanghai University of Sport

4.《北京体育大学学报》,北京体育大学

《Journal of Beijing Sport University》, Beijing Sport University

5.《体育与科学》,江苏省体育科学研究所

《Sports and Science》, Jiangsu Institute of Sports Science

6.《体育学刊》,华南师范大学

《Journal of Physical Education》, South China Normal University

7.《中国体育科技》,国家体育总局

《China Sports Science and Technology》, State Sports General Administration

8.《Journal of Sport and Health Science》， China

9.《European Journal of Sport Science》， European Journal of Sports Science, UK

10.《Journal of Applied Sport Psychology》， Journal of Applied Sports Psychology，UK

11．《Journal of Sport Management》， Sports Management Magazine, United States

12.《Journal of Sports Medicine and Physical Fitness》， Journal of Sports Medicine and Health，Italy

(0701) Mathematics Training Program for International Postgraduates

(0701) 数学 硕士留学生 培养方案

一、Training Goal 培养目标

This discipline is designed to nurture high-level experts characterized by comprehensive development in moral, intellectual, and physical aspects, capable of embarking on teaching and research endeavors within the realms of mathematics and associated disciplines. The specific criteria are delineated as follows: Demonstrate elevated political acumen and exemplary moral virtues, adhere to laws and regulations, foster a spirit of unity and collaboration, maintain rigorous scholarly conduct, and possess a fervent commitment to their vocation along with a dedication to contribute significantly in their field. Exhibit a robust and profound foundation in mathematical theories, accompanied by a systematic and deep-seated expertise in the domain of mathematics. Equip themselves with the preliminary capacity to initiate independent scientific inquiries or undertake specialized technical responsibilities independently, and to produce research outcomes of theoretical or practical relevance in a chosen avenue. Attain proficiency in a foreign language, capable of adeptly reading scholarly materials in the relevant field in that language, and demonstrating considerable competency in international academic discourse and professional manuscript composition.

该学科旨在培养德智体全面发展的高水人才，能够在数学和相关学科领域从事教学和研究工作。具体的标准是：表现出较高的政治思想觉悟和高尚的道德品质，遵守法律法规，培养团结协作的精神，保持严谨的学术行为，对自己的职业充满热情，并致力于在自己的领域做出重大贡献。具有坚实而深厚的数学理论基础，并在数学领域具有系统而深入的专业知识。具备独立开展科学研究或独立承担专业技术责任的初步能力，并在选定的道路上产生具有理论或实践意义的研究成果。熟练掌握一门外语，能够熟练阅读该语言相关领域的学术资料，并在国际学术论述和专业稿件撰写方面表现出相当的能力。

二、Training Directions 研究方向

Training Directions 研究方向	Research Contents 研究内容
Differential Equations and Their Applications 微分方程及其应用	This field primarily investigates the pertinent theories and application issues of various differential equations. The theoretical issues include: ordinary differential equations, boundary value problems of elliptic partial differential

	equations, stability, bifurcation, and chaos issues concerning differential equations, and so on. The application issues include: analysis of reservoir transport models, dynamic analysis and simulation of differential equation models in the biological, financial, and other sectors, stability and persistence issues in population systems, etc. This field finds extremely wide-ranging applications in various domains of production and daily life. 主要研究各种微分方程的相关理论和应用问题。理论问题包括：常微分方程、椭圆型偏微分方程边值问题、微分方程的稳定性、分歧和混沌问题等。应用问题包括：水库运输模型的分析、生物、金融等领域微分方程模型的动态分析和模拟、人口系统的稳定性和持续性问题等。这一领域在生产和日常生活的各个领域有着极为广泛的应用。
Mathematical Model Analysis 数学模型分析	This field is grounded in applied disciplines such as geological/geographical information science, geological statistics, mineral geology, and oil and gas exploration, employing mathematical theories, mathematical models, and numerical computing as tools. It encompasses computational methods in Earth science and information science, novel technologies for mining and energy data, mathematical issues in energy exploration and development, spatial statistical representation of geological data and information, as well as research in big data and machine learning. 以地质/地理信息科学、地质统计学、矿产地质学、油气勘探等应用学科为基础，以数学理论、数学模型和数值计算为工具。它涵盖了地球科学和信息科学中的计算方法、挖掘和能源数据的新技术、能源勘探和开发中的数学问题、地质数据和信息的空间统计表示，以及大数据和机器学习的研究。

Scientific Computational Methods 科学计算方法	This research direction focuses on the finite volume schemes of conservation law equations, encompassing aspects such as discontinuous jump conditions, entropy conditions, Riemann solvers, high-precision shock capturing schemes and their stability. It also explores high-precision algorithms in finite element methods, finite element methodologies for fractional order problems, spectral methods, mesh-free methods, and more. In the realm of numerical algebra, it includes the algorithms for algebraic equation systems, least squares problems, and eigenvalue problems. In accordance with the structural characteristics of matrices in actual problems, it aims to design fast and reliable algorithms. 该研究方向主要围绕守恒律方程的有限体积格式展开，包括间断跳跃条件、熵条件、黎曼求解器、高精度激波捕获格式及其稳定性等方面。它还探索了有限元方法中的高精度算法，分数阶问题的有限元方法，谱方法，无网格方法等。在数值代数领域，它包括代数方程组、最小二乘问题和特征值问题的算法。针对实际问题中矩阵的结构特点，设计快速可靠的算法。
Machine Learning 机器学习	This research direction focuses on how computers can simulate or implement human learning behaviors to acquire new knowledge or skills, and reorganize existing knowledge structures to continually improve their performance. The principal areas of investigation include supervised learning, unsupervised learning, and weakly supervised learning, along with their applications in fields such as facial and voice recognition, text and network data processing, and the exploration and prediction of natural resources. 该研究方向着眼于计算机如何模拟或实现人类的学习行为以获取新的知识或技能，并重新组织现有的知识结构以不断提高其性能。其主要研究领域包括有监督学

	习、无监督学习和弱监督学习，以及它们在人脸和语音识别、文本和网络数据处理、自然资源勘探和预测等领域的应用。
Combinatorial Mathematics and Graph Theory and Their Applications 组合数学与图论及其应用	This field delves into frontier topics in algebra, combinatorial mathematics, and graph theory. Leveraging an integrated approach that encompasses number theory, combinatorics, and algebra, it explores various pertinent issues and their applications, including representation theory, homology theory, enumerative combinatorics, design and configuration, extremal combinatorics, discrete dynamical systems, structural graph theory, extremal graph theory, algebraic graph theory, topological graph theory, algorithmic graph theory, and complex networks. 该研究方向深入研究代数、组合数学和图论的前沿课题。本课程以数论、组合论、代数为核心，探讨了包括表示理论、同调理论、计数组合论、设计与构形、极值组合论、离散动力系统、结构图论、极值图论、代数图论、拓扑图论、算法图论、复杂网络等在内的众多相关问题及其应用。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 28. Curriculum settings include Common Degree Programs, Compulsory Major Courses, Major 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.

研究生学习年限一般为 3 年，最长为 4 年，学分不少于 28 学分。课程设置包括通用学位课程、必修专业课程、专业选修课程等必修部分。研究生课程采取硕博打通模式，一般每个学分相当于 16 学时。

四、Curriculum Settings 课程设置

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	M319039	Master Literature Review (Mathematics and Physics) 硕士文献综述（数理）	32	2	Autumn 秋季	School of Science 数理学院	Public report evaluation (no less than 5000 words; More than 25 references, of which foreign literature accounts for more than 20%, and literature accounts for more than 30% in the past five years) 文献综述(不少于5000字；参考文献25余篇，其中外文文献占比20%以上，近5年文献占比30%以上)
	M319028	Technical Writing (Mathematics and Science) 科技写作（数	32	2	Autumn 秋季	School of Science 数理学院	

		理）					
	M319005	Algebra 代数学	48	3	Spring 春季	School of Science 数理学院	
	M319060	Optimization Methods 最优化方法	48	3	Autumn 秋季	School of Science 数理学院	
Major Optional Courses 专业选修课	GM99994	Statistical Calculation 统计计算	40	2	Autumn 秋季	School of Science 数理学院	
	GM99995	Numerical Analysis 数值分析	40	2	Autumn 秋季	School of Science 数理学院	
	GM99996	Mathematical Software 数学软件	40	2	Autumn 秋季	School of Science 数理学院	
	GM99997	Numerical Solution of Partial Differential Equation 偏微分方程数值解	40	2	Autumn 秋季	School of Science 数理学院	
	GM99999	Machine Learning 机器学习	40	2	Autumn 秋季	School of Science 数理学院	
	M319045	Graph Theory and Its Applications 图论及其应用	32	2	Spring 春季	School of Science 数理学院	
	M319007	Functional Analysis 泛函分析	48	3	Autumn 秋季	School of Science 数理学院	
	M319026	Financial Mathematical Method 金融数学方法	32	2	Spring 春季	School of Science 数理学院	
	M319047	Differential Geometry 微分几何	32	2	Spring 春季	School of Science 数理学院	
	M319002	Mathematical Biology 生物数学	32	2	Spring 春季	School of Science 数理学院	
	M503001	Graduate Student Stress	16	1	Autumn 秋季	Graduate School	

		Management 研究生压力管理				研究生院	
	M319055	Modern Optimization Calculation Methods 现代优化计算方法	32	2	Spring 春季	School of Science 数理学院	
	M319027	Matrix Calculation 矩阵计算	32	2	Spring 春季	School of Science 数理学院	
	M319052	Modern Control Theory 现代控制理论	32	2	Spring 春季	School of Science 数理学院	
	M319006	Multivariate Statistical Analysis 多元统计分析	48	3	Autumn 秋季	School of Science 数理学院	
	M319046	Qualitative Analysis of Differential Equation 微分方程定性分析	32	2	Spring 春季	School of Science 数理学院	
	M319042	Stochastic Process 随机过程	48	3	Spring 春季	School of Science 数理学院	
Compulsory Parts 必修环节	Basic Chinese practice 汉语基础实践			1	Autumn 秋季	——	
	Professional application of Chinese 汉语专业应用			2	Summer 夏季	——	
	Professional Practice 专业实践			2			
	Thesis Opening Report 论文开题报告			——			
	Interim Report 论文中期报告			——			
	Listen to reports 听学术报告						no less than 8 不少于 8 次
	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、必修环节中汉语基础实践、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

Classic Literatures:

1. Functional Analysis, Gongqing Zhang, Peking University Press, 2005. (in Chinese)

2. Nonlinear Functional Analysis, Dajun Guo, Shandong University of Science and Technology Press, 2001. (in Chinese)

3. Advanced Probability Theory, Shihong Cheng, Peking University Press, 1996. (in Chinese)

5. Numerical Analysis, Jie Ouyang, Higher Education Press, 2009. (in Chinese)

6. Applied Stochastic Processes (5th Edition), Bo Zhang and Hao Shang, China Renmin University Press, 2020. (in Chinese)

7. Wavelets Ten Lectures, Ingrid Daubechies (translated by Hongfeng Jia), World Book Publishing Company, 2017. (in Chinese)

8. Mathematical Physics Equations (3rd edition), Chaohao Gu, Higher Education Press, 2012. (in Chinese)

9. Introduction to Reaction-diffusion Equation (2nd Ed.), Qixiao Ye, Science Press, 2011. (in Cinese)

10. Functional Differential Equations, Zuxiu Zheng, Anhui Education Press, 1994. (in Chinese)

11. Qualitative Theory of Ordinary Differential Equations, Zhifen Zhang et al., Science Press, 1981. (in Chinese)

12. Some New Methods of Computational Fluid Mechanics, Ruxun Liu, Qiwang Shu, Science Press, 2003. (in Chinese)

13. Mathematical Basis of Finite Element Method, Liheng Wang, Xuejun Xu, Science Press, 2007. (in Chinese)

14. Six Lectures on Matrix Calculation, Shufang Xu and Jiang Qian, Higher Education Press, 2011. (in Chinese)

15. Matrix Computation in Cybernetics, Shufang Xu, Higher Education Press, 2011. (in Chinese)

16. Higher-Order Spectral Analysis: A Nonlinear Signal Processing Framework, C L Nikias, A P Petropulu, NJ: Prentice-Hall, 1993.

17. Partial differential equations, L.Evans, American Mathematical Society, 2010.

18. Partial functional differential equations, Jianhong Wu, Springer, 1996.

19. Analysis(2nd Edition), E.H.Lieb, American Mathematical Society, 2001.

20. Semigroups of Linear Operators and Application to Partial Differential Equations, A.Pazzy, Springer, 2011.
21. Numerical Mathematics, A.Quarteroni, R.Sacco and F. Salerno, Springer Science, 2000.
22. Matrix Computations(4th Edition), G.H.Goluv, C.F. Van Loan, The John Hopkins University Press, 2012.
23. Iterative Methods for Sparse Linear Systems(2nd Edition), Y.Saad, SIAM, Philadelphia, Pennsylvania, 2000.
24. Michael Struwe, variational Methods, Springer, 2012.
25. Riemann Solvers and Numerical Methods for Fluid Dynamics: A Practical Introduction(3rd Edition), E.F. Toro, Springer-Verlag, 2009.
26. Matrix Computations, Gene H. Golub, Charles F. Van Loan, Johns Hopkins Press, 2013.
27. Accuracy and Stability of Numerical Algorithms, Nicholas Higham, SIAM, 2002.
28. Applied Numerical Linear Algebra, James Demmel, SIAM, 1997.
29. The Mathematical Theory of Finite Element Methods(3rd Edition), Susanne C. Brenner and L. Ridgway Scott, Springer-Verlag, 2010.
30. Machine learning in action, Harrington M., Manning Publications, 2012.

Journals:

1. SCIENCE CHINA (in Chinese）
2. Chinese Science Bulletin （in Chinese）
3. Acta Mathematica Sinica （in Chinese）
4. Chinese Annals of Mathematics （in Chinese）
5. Advances In Mathematics (China) （in Chinese）
6. Acta Mathematica Scientia （in Chinese）
7. Applied Mathematics and Mechanics （in Chinese）
8. Journal of Systems Science and Mathematical Sciences （in Chinese）
9. Chinese Journal of Applied Probability and Statistics （in Chinese）
10. Mathematica Applicata （in Chinese）
11. JOURNAL OF APPLIED STATISTICS AND MANAGEMENT （in Chinese）
12. Mathematica Numerica Sinica （in Chinese）
13. Numerical Mathematics A Journal of Chinese Universities （in Chinese）
14. Mathematics in Practice and Theory （in Chinese）
15. Operations Research Transactions （in Chinese）

16. Applied Mathematics A Journal of Chinese Universities （in Chinese）
17. Chinese Journal Of Engineering Mathematics （in Chinese）
18. Systems Engineering-Theory & Practice （in Chinese）
19. Pattern Recognition and Artificial Intelligence （in Chinese）
20. Journal of Biomathematics （in Chinese）
21. Journal of Data Acquisition and Processing （in Chinese）
22. Journal of Mathematics （in Chinese）
23. Acta Analysis Functionalis Applicata （in Chinese）
24. Journal of Mathematical Research and Exposition （in Chinese）
25. IEEE Trans. on Signal Processing
26. Journal of the American Math. Society
27. Journal of the Amer. Statistical Associate
28. Journal of Multivariate Analysis
29. SIAM Journal on Applied Mathematics
30. Journal of Functional Analysis
31. Journal of Partial Differential Equation
32. Calculus of Variations and P. D. E.
33. Discrete and Cont. Dyn. Systems
34. Journal of Differential Equations
35. Nonlinear Analysis-TMA
36. Rocky Moutain J. of Mathematics
37. J. of Comput. and Applied Math.
38. Applied Math. and Computational

(0702) Physics Training Program for International Postgraduates

(0702) 物理学 硕士留学生 培养方案

一、Training Goal 培养目标

This discipline cultivates students with a scientific spirit of seeking truth from facts, rigor, and innovation, who can aspire to serve the construction and development of the motherland. They have a solid and broad foundation in physics and in-depth professional knowledge, master corresponding physics experimental skills and methods, understand the research trends and development status of this discipline at home and abroad, and have the ability to engage in scientific research, teaching work, and undertake professional technical work in basic physics, applied physics, physics and geology, new energy and other interdisciplinary directions; the ability to read foreign literature and write foreign papers in this discipline, with a certain international perspective and good international communication skills; the ability to apply computer and network technology required for conducting relevant scientific research.

本学科培养学生具有实事求是、严谨、创新的科学精神，能够立志为祖国的建设和发展服务，具有扎实宽厚的物理学基础和系统深入的专业知识，掌握相应的物理实验技能和方法，了解本学科国内外的研究动向及发展状况，具备从事基础物理、应用物理以及物理学与地学、新能源等交叉方向的科学研究、教学工作和承担专业技术工作的能力；能够阅读本学科的外文文献及撰写外文论文，具有一定国际视野和良好的国际交流能力；具有从事相关科学研究所需要的计算机与网络技术应用的能力。

二、Training Directions 研究方向

Training Directions 研究方向	Research Contents 研究内容
Mineral Physics and Applications 矿物物理与应用	Based on the geological characteristics and disciplinary advantages of our university, this direction focuses on minerals as the main research object, with a focus on studying the basic physical properties and structure performance relationships of minerals under normal and extreme conditions, such as dielectric, magnetic, pyroelectric/optical properties, as well as their physical mechanisms. It explores the application and development of minerals and related materials in geological dating, phase change energy storage, information storage, ecological environment, and other fields. 结合本校的地学特色和学科优势，本方向以矿物为主要研究对象，重点研究常态及极端条件下矿物的介电、磁性、热释电/光等基础物性与结构等构效关系及其物理机制，探索矿物及相关材料在地质计年、相变储能、信息存储、生态环境等方面的应用与开发。
New Energy Physics 新能源物理	Based on the national strategic demand for new energy and disciplinary advantages, this direction focuses on the design, physical property characterization, structure-activity relationship analysis, and performance regulation of new energy materials and new low

	dimensional materials. It integrates physics, energy, materials, environment, and other disciplines, with a focus on their application and development in solar cells, field-effect transistors, electrochemical energy storage, photocatalysis, optoelectronic detection devices, and other fields. 结合国家对新能源重大战略需求和学科优势，本方向以新能源材料及新型低维材料的设计、物性表征、构效关系分析及性能调控为基础，融合物理、能源、材料、环境等学科，重点研究其在太阳能电池、场效应晶体管、电化学储能、光催化、光电探测器件等方面的应用与开发。
Optics 光学	Based on the characteristics and disciplinary advantages of our school's geology, this direction focuses on the significant demand for optical sensing and detection technology in the field of geology. It focuses on key technical issues such as optical characterization and evaluation of minerals, pollution and monitoring of mineral resources, and conducts experimental and theoretical research on the relevant mechanisms and applications of optical transmission, optical imaging, photon materials, and electronic devices, promoting the application of optics in the field of geology. 结合本校地学特色和学科优势，本方向针对地学领域对光传感与光探测技术的重大需求，围绕矿物的光学表征与评价、矿产资源的污染与监测等关键技术问题，重点开展光传输、光成像、光子材料以及电子器件的相关机理与应用的实验及理论研究，推动光学在地学领域的应用。
Condensed matter physics 凝聚态物理	Combining the development of modern physics and disciplinary advantages, this direction starts from a microscopic perspective to study the spatial structure, electronic structure, and various related physical properties of condensed matter. It focuses on the microscopic origins or explanations of various physical properties of condensed matter, providing a theoretical basis for the development of new materials and devices, and promoting the application of condensed matter physics in materials, energy, and related devices. 结合现代物理学的发展及学科优势，本方向从微观角度出发，研究凝聚态物质的空间结构、电子结构以及相关的各种物理性质，重点关注凝聚态物质的多种物理性质的微观起源或解释，为开发新材料、新器件提供理论基础，推动凝聚态物理学在材料、能源及相关器件等方面的应用。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 28. Curriculum settings include Common Degree Programs, Compulsory Major Courses, Major 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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

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	GM99995	Numerical Analysis 数值分析	40	2	Spring 春	School of Science 数理	Choose one from seven 七选一
	GM99998	Applied Time Series Analysis 应用时间序列分析	40	2	Spring 春	School of Science 数理	
	GM99994	Statistical calculation 统计计算	40	2	Autumn 秋	School of Science 数理	
	GM99999	Machine Learning 机器学习	40	2	Spring 春	School of Science 数理	
	GM99996	Mathematical software 数学软件	40	2	Spring 春	School of Science 数理	
	GM99993	Applied Multivariate Statistical Analysis 应用多元统计分析	40	2	Autumn 秋	School of Science 数理	

	GM99997	Numerical solutions of partial differential equations 偏微分方程数值解	40	2	Autumn 秋	School of Science 数理	
	M319048	Progress in Physics Research 物理学研究进展	32	2	Autumn 秋	School of Science 数理	
	M319016	Solid State Theory 固体理论	32	2	Autumn 秋	School of Science 数理	
	M319039	硕士文献综述（数理）	32	2	Autumn 秋	School of Science 数理	硕士文献综述采用公开报告方式考评（文字不低于 5000 字；参考文献 50 篇以上，其中外文文献占比 50%，以上，近五年文献占比 70%以上）
Major Optional Courses 专业选修课	M319059	Modern Physics Experiment 现代物理实验	32	2	Spring 春	School of Science 数理	≥2 credits 不少于 2 学分
	M319061	Physics of Semiconductor Devices 半导体器件物理	32	2	Spring 春	School of Science 数理	
	M319056	Physics of New Energy Materials 新能源材料物理	32	2	Spring 春	School of Science 数理	
	M319057	Information Optics 信息光学	32	2	Autumn 秋	School of Science 数理	

M503001	Graduate stress management 研究生压力管理	16	1	Autumn 秋	研院	
M303010	Crystal Chemistry and Crystal Physics 晶体化学与晶体物理	48	3	春	材料	
M319058	Data processing and analysis 数据处理与分析	32	2	Autumn 秋	School of Science 数理	
M319017	Optoelectronic Information Materials 光电信息材料	32	2	Autumn 秋	School of Science 数理	
M319023	Laser Physics and Laser Technology 激光物理学与激光技术	32	2	Autumn 秋	School of Science 数理	
M319024	computational physics 计算物理学	32	2	Spring 春	School of Science 数理	
M319051	Principles and Applications of Modern Testing Technology 现代测试技术原理与应用	32	2	Autumn 秋	School of Science 数理	
M319035	Experimental design and optimization 试验设计及最优化	32	2	Spring 春	School of Science 数理	
M319009	Advanced Optics 高等光学	32	2	Spring 春	School of Science 数理	
M319031	Mineral Physics 矿物物理学	32	2	Spring 春	School of Science 数理	

	M319010	Advanced Quantum Mechanics 高等量子力学	32	2	Spring 春	School of Science 数理	
	M319033	Introduction to Condensed Matter Physics 凝聚态物理学导论	32	2	Spring 春	School of Science 数理	
Compulsory Parts 必修环节	汉语基础实践			1	Autumn 秋	——	
	汉语专业应用			2	夏	——	
	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、必修环节中汉语基础实践、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

学术专著

1. 《矿物物理学概论》，陈丰等，科学出版社，1995 年；

Introduction to Mineral Physics, Chen Feng et al., Science Press, 1995;

2. 《结晶学与矿物学》，李胜荣主编，地质出版社，2008 年；

Crystallography and Mineralogy, edited by Li Shengrong, Geological Publishing House, 2008

3. 《晶体化学及晶体物理学》，廖立兵等编，科学出版社，2013 年；

Crystal Chemistry and Crystal Physics, edited by Liao Libing et al., Science Press, 2013;

4. 《辐射和光场的量子统计理论》曹昌祺，科学出版社，2006 年；

Quantum Statistical Theory of Radiation and Light Field "by Cao Changqi, published by Science Press in 2006;

5. 《Quantum Optics》 D.F. Walls, G. J. Milburn,Springer 1995 年；

6. 《Principles of Optics》Born, Wolf,清华大学出版社，第七版，2015 年；

Principles of Optics, Born, Wolf, Tsinghua University Press, 7th edition, 2015;

7. 《高等光学教程》赵达尊、方俊永，北京理工大学出版社，2009 年；

Advanced Optics Course "by Zhao Dazun and Fang Junyong, published by Beijing Institute of

Technology Press in 2009;

8. 《激光原理与技术》柳强、王在渊，清华大学出版社，2020 年；

Laser Principles and Technology "by Liu Qiang and Wang Zaiyuan, published by Tsinghua University Press in 2020;

9. 《量子力学新进展（第五辑）》龙桂鲁等，清华大学出版社，2011 年；

New Advances in Quantum Mechanics (Volume 5), Long Guilu et al., Tsinghua University Press, 2011;

10. 《量子计算与量子信息原理(卷：基本概念) 》[意] Giuliano Benenti 等著，王文阁等译，科学出版社，2011 年；

Quantum Computing and Quantum Information Principles (Volume: Basic Concepts) "by Giuliano Benenti et al., translated by Wang Wenge et al., Science Press, 2011;

11. 《量子统计物理学》孙宝玺，科学出版社，2020 年；

Quantum Statistical Physics, Sun Baoxi, Science Press, 2020;

12. 《热力学与统计物理学（第二版）》林宗涵，北京大学出版社，2018 年；

Thermodynamics and Statistical Physics (Second Edition) "by Lin Zonghan, published by Peking University Press in 2018;

13. 《群论及其在凝聚态物理中的应用》，李新征，北京大学出版社，2019 年；

Group Theory and Its Applications in Condensed Matter Physics ", Li Xinzheng, Peking University Press, 2019;

14. 《凝聚态物理》（英文影印版）(美)米斯拉(P. K. Misra)著，北京大学出版社，2014 年；

Condensed Matter Physics "(English photocopy) by P. K. Misra, published by Peking University Press in 2014;

15. 《凝聚态物理学进展》（第二版），田强和涂清云，科学出版社，2018 年；

Progress in Condensed Matter Physics (Second Edition), Tian Qiang and Tu Qingyun, Science Press, 2018;

16. 《固体理论》(第二版)， 张正中，高等教育出版社，2002 年；

Solid State Theory (Second Edition), Zhang Zhengzhong, Higher Education Press, 2002;

17. 《固体物理学》，韩汝琦/黄昆，高等教育出版社，1998 年；

Solid State Physics, Han Ruqi/Huang Kun, Higher Education Press, 1998;

18. 《半导体物理学》(第七版)刘恩科，电子工业出版社，2011 年；

Semiconductor Physics (7th edition) by Liu Enke, published by Electronic Industry Press in 2011;

19. 《先进材料进展》杜丕一、宋晨路、樊先平和韩高荣，浙江大学出版社。2011 年；

Progress in Advanced Materials "by Du Piyi, Song Chenlu, Fan Xianping, and Han Gaorong, published by Zhejiang University Press. In 2011;

20. 《太阳电池材料 》杨德仁，化学工业出版社，2011 年；

Yang Deren, Materials for Solar Cells, Chemical Industry Press, 2011;

21. 《电化学储能材料与原理》，张会刚等，科学出版社，2020 年；

Electrochemical Energy Storage Materials and Principles ", Zhang Huigang et al., Science Press, 2020;

22. 《材料现代分析方法》，左演生编著，北京工业大学出版社，2005 年；

Modern Methods of Material Analysis ", edited by Zuo Yansheng, published by Beijing University of Technology Press in 2005;

23. 《半导体的检测与分析》，许振嘉编著，科学出版社，2007 年；
Detection and Analysis of Semiconductors ", edited by Xu Zhenjia, published by Science Press in 2007;

24. 《普通物理学》（第五版），程守洙等，高等教育出版社，2019 年；

General Physics (5th edition), Cheng Shouzhu et al., Higher Education Press, 2019;

25. 《粉末衍射法测定晶体结构》上、下册（第二版）科学出版社，2011 年。

Determination of Crystal Structure by Powder Diffraction Method, Volume 1 and 2 (Second Edition), Science Press, 2011.

专业期刊

1. Nature

2. Science

3. Nature Physics

4. Nature Materials

5. Nature Energy

6. Nature communications

7. Science Advance

8. Review of Modern Physics

9. Physical Review Letters

10. Physics Letters B

11. Physics Today

12. Optics Express

13. Optics Letters

14. Applied Optics

15. Journal of Applied Optics

16. Chinese Optics Letters

17. Applied Physics Letters

18. Advanced Energy Materials

19. Advanced Materials

20. ACS Energy Letters

21. Chem
22. Joule

(0703) Chemistry Training Program for International Postgraduates

(0703) 化学 硕士留学生 培养方案

一、Training Goal 培养目标

This discipline aims to cultivate high-level specialized professionals who are well-rounded in morality, intelligence, physical fitness, aesthetics, and labor skills, in order to meet the needs of China's economic and social development. The specific requirements are as follows: (1) Mastery of Marxism-Leninism, Mao Zedong Thought, and the theory of socialism with Chinese characteristics; support for the basic line and policies of the Communist Party of China; love for the motherland; adherence to discipline and laws; and possession of good moral qualities. Demonstrating an enterprising and pragmatic attitude, a spirit of unity and cooperation, and a strong scientific literacy. (2) Mastery of solid and extensive theoretical knowledge in chemistry, systematic specialized knowledge, and proficient skills in chemical experiments. Keeping up with the latest developments in the forefront areas of chemistry-related disciplines. Cultivating students' scientific appreciation and equipping them with strong problem-solving abilities, innovative thinking, and the ability to conduct scientific research. This enables students to engage in teaching, research, and management work in the field of chemistry and related disciplines, or to independently undertake specialized technical work. (3) Proficiency in one foreign language, with the ability to read professional literature in chemistry and related fields fluently and to write scientific papers in foreign languages.

本学科培养适应我国经济、社会发展需要，德智体美劳全面发展的高层次专门人才。具体要求：1. 掌握马列主义、毛泽东思想和建设有中国特色社会主义理论，拥护中国共产党的基本路线和方针政策，热爱祖国，遵纪守法，具有良好的道德品质。具有开拓进取、严谨求实、团结协作的学风和良好的科学素养。2. 掌握坚实宽广的化学基础理论知识、系统的专门知识和熟练的化学实验技能，掌握化学相关学科前沿领域的发展动态，培养学生的科学鉴赏力，使得学生具有较强的解决实际问题的能力、创新意识和开展科学研究的能力，能够从事化学及相关专业教学、科研和管理工作或独立承担专门技术工作。3. 掌握一门外国语，能熟练地阅读化学及其相关领域的专业文献，能较为熟练地撰写外文科技论文。

二、Training Directions 研究方向

Training Directions 研究方向	Research Contents 研究内容
Inorganic chemistry 无机化学	This research direction primarily centers on investigating various inorganic substances and materials, such as inorganic coordination polymers, rare earth materials, and inorganic-organic hybrid materials. It utilizes relevant theories and research methods of inorganic chemistry to explore these materials. The main areas of research encompass: (1) Functional ceramic materials, (2) Inorganic coordination compounds, (3) Metal/organic framework nanomaterials, and (4) The development and application of new technologies and methods for preparing rare earth luminescent materials, inorganic-organic hybrid materials, etc. 该方向以无机物及材料为研究对象，主要运用无机化学的相关理论和研究方法开展无机配位聚合物、稀土材料及无机有机杂化材料等方面的研究。主要研究领域包括：(1)功能陶瓷材料；(2)无机配位化合物；(3)金属/有机框架纳米材料；(4)稀土发光材料、无机/有机杂化材料等制备新技术与新方法的基础和应用研究等。
Organic and polymer chemistry 有机及高分子化学	This research direction emphasizes the investigation of organic and polymer compounds and materials. It primarily utilizes relevant theories and research methods in organic and polymer chemistry to explore novel luminescent, energy storage, catalytic materials, and

	more. The main research areas encompass: (1) Designing and characterizing organic materials based on induced luminescence, (2) Preparing and studying the properties of two-dimensional carbon materials, (3) Constructing and applying high-performance metal-polymer materials, (4) Conducting research on the modification and preparation of polymer rubber materials. 该方向以有机、高分子化合物及材料为研究对象，主要运用有机及高分子化学的相关理论和研究方法开展新型有机及高分子发光、储能、催化材料等方面的研究。主要研究领域包括：(1)基于诱导发光的有机材料的设计与性能；(2)二维碳材料的制备及性能；(3)高性能金属聚合物材料的构筑及应用；(4)高分子橡胶材料的改性与制备研究等。
Analytical chemistry 分析化学	This research direction centers on analyzing geological and environmental samples, primarily employing analytical chemistry theories and research methods to investigate life analysis, geological analysis, and environmental analysis. The main areas of research encompass: (1) Developing microfluidic analysis methods, (2) Establishing chemical sensing methods that rely on optoelectronic signals, (3) Establishing high-sensitivity analysis techniques for geological samples, and (4) Utilizing spectroscopy, chromatography, and electrochemical analysis techniques for isotopic and morphological analysis of geological and environmental samples. 该方向以地质、环境样品为研究对象，主要运用分析化学的相关理论和研究方法开展生命分析、地质和环境分析等方面的研究。主要研究领域包括：(1)微流控分析方法的建立；(2)基于光电信号的化学传感方法的建立；(3)地质样品的高灵敏度分析方法的建立；(4)利用光谱、色谱、电化学分析等技术进行地质、环境样品的同位素及形态分析等。
Physical Chemistry and Computational Chemistry 物理化学与计算化学	This research direction focuses on the investigation of energy and materials. It employs pertinent physicochemical theories and research methodologies to delve into advanced energy technologies, the physical and chemical properties of materials, and molecular simulation. The main areas of research encompass: (1) Advanced clean energy technologies, including energy and electrochemical storage, (2) The development of novel battery materials and the study of electrochemical interface processes, (3) Photo/electric catalytic performance optimization and mechanism study through molecular simulation and design, and (4) The application of surfactants in oilfield chemistry. 该方向以能源、材料中的物质为研究对象，主要运用物理化学的相关理论和研究方法开展先进能源、材料物化性能、分子模拟等方面的研究。主要研究领域包括：(1)氢能、电化学储能等先进清洁能源技术；(2)新型电池材料、电化学界面过程等；(3)利用分子模拟与设计开展材料光电催化性能及机理研究；(4)油田化学中表面活性剂等应用研究。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 28. Curriculum settings include Common Degree Programs, Compulsory Major Courses, Major 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 28 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

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	GM99993/9	Common Math Course 公共数学基础课	40	2	Autumn	School of Science	公共数学基础课有GM99993应用多元统计分析、GM99994统计计算、GM99995数值分析、GM99996数学软件、GM99997偏微分方程数值解、GM99998应用时间序列分析、GM99999机器学习，七选一。
	M319011	Advanced Inorganic Chemistry 高等无机化学	48	3	Autumn	School of Science	One-out-of-two 二选一

	M319013	Advanced organic Chemistry 高等有机化学	48	3	Spring	School of Science	
	M319028	Scientific Writing (School of Science) 科技写作（数理）	32	2	Autumn	School of Science	≥2 credits 不少于2学分
	M319039	Literature Review for Graduate (School of Science) 硕士文献综述（数理）	32	2	Autumn	School of Science	
	M319054	Modern Instrument Analysis 现代仪器分析	48	3	Autumn	School of Science	
Major Optional Course 专业选修课	M319025	Surface Chemistry 界面化学	32	2	Spring	School of Science	≥3 credits 不少于3学分
	M319049	Advanced Material Chemistry 先进材料化学	32	2	Autumn	School of Science	
	M319004	Catalyze Principle and Application 催化原理及其应用	32	2	Spring	School of Science	
	M319015	Solid Chemistry 固体化学	32	2	Spring	School of Science	
	M503001	Stress Management for Graduate 研究生压力管理	16	1	Autumn	School of Science	
	M319032	Quantum Chemistry 量子化学	32	2	Spring	School of Science	
	M319021	Environment Chemistry 环境化学	32	2	Autumn	School of Science	
	M319019	Safety in Chemical Laboratory 化学实验室安全	16	1	Autumn	School of Science	
	M319050	Modern Testing Technology and Practice 现代测试技术与实践	32	2	Autumn	School of Science	
	M319020	Progress in Chemistry 化学研究进展	16	1	Spring	School of Science	
	M319018	Chemical Kinetics 化学动力学	32	2	Spring	School of Science	

	M319008	Separation Science and Technology 分离科学与技术	32	2	Spring	School of Science	
	M319012	Advanced Physical Chemistry-Principle and Application 高等物理化学-原理与应用	32	2	Spring	School of Science	
	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 Chinese practice 汉语基础实践		16	1	秋	——	
	Professional application of Chinese 汉语专业应用		32	2	夏	——	

	Professional Practice 专业实践		2			Please accomplish one of the following tasks: (1) working as teaching assistant of one course; (2) participating in instrument training and management (at least one semester); (3) participating in lab safety and management work (at least one semester).
	Thesis Opening Report 论文开题报告		——			The requirements are listed in CUGB temporary management methods for graduate thesis opening report.

	Interim Report 论文中期报告		——			The requirements are listed in CUGB evaluation methods for graduate thesis interim report.
	Academic report delivery 作学术报告		——			≥1 time oral presentation at international and domestic academic conferences 国际国内学术会议口头报告不少于 1 次

Remarks：Common Degree Programs are offered by International Cooperation and Exchange Office.
备注：公共学位课、必修环节中汉语基础实践、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 literatures：

（1）《Chemistry of Organic Pollution》edited by Wang Liansheng, Beijing: Higher Education Press, 2004
《有机污染化学》王连生主编，北京：高等教育出版社，2004
（2）《Guide to Theory of Modern Separation Science》edited by Geng Xindu, Beijing: Higher Education Press, 2010
《现代分离科学理论导引》耿信笃主编，北京：高等教育出版社，2010
（3）《Colloid and Interface Chemistry》edited by Liu Hongguo et al, Beijing: Chemical Industry Press, 2016
《胶体与界面化学》刘洪国等编，北京：化学工业出版社，2016
（4）《March's Advanced Organic Chemistry》edited by Michael B Smith, Beijing: Chemical Industry Press, 2018
《高等有机化学》Michael B Smith 编著，北京：化学工业出版社，2018

（5）《Material Modern Design Theory and Method》edited by Cao Maosheng et al, Harbin: Harbin Institute of Technology Press, 2012
《材料现代设计理论与方法》曹茂盛等编，哈尔滨：哈尔滨工业大学出版社，2012
（6）《Quantum Chemistry》edited by Xu Guangxian et al, Beijing: Science Press, 2009
《量子化学》徐光宪等编，北京：科学出版社，2009
（7）《Modern Organic Synthesis Methods and Technologies》edited by Xue Yongqiang et al, Beijing: Chemical Industry Press, 2011
《现代有机合成方法与技术》薛永强等编，北京：科学出版社，2011
（8）《Introduction to Catalytic Chemistry》edited by Han Weiping et al, Beijing: Science Press, 2013
《催化化学导论》韩维屏等编，北京：科学出版社，2013
（9）《Contemporary Instrumental Analysis》edited by Kenneth A. Rubinson, Beijing: Science Press, 2018
《现代仪器分析》Kenneth A. Rubinson 主编，北京：科学出版社，2018
（10）《Inorganic Synthesis and Preparative Chemistry》edited by Xu Ruren et al, Beijing: Higher Education Press, 2009
《无机合成与制备化学》徐如人等编，北京：高等教育出版社，2009

2. Academic journals：

（1）Acta Chimica Sinica 化学学报
（2）Science in China Series B: Chemistry 中国科学 B 辑
（3）Chemical Journal of Chinese Universities 高等学校化学学报
（4）Chemistry Bulletin 化学通报
（5）Chemical Letters 化学快报
（6）Analytical Chemistry 分析化学
（7）Organic Chemistry 有机化学
（8）Applied Chemistry 应用化学
（9）Acta Physico-Chimica Sinica 物理化学学报
（10）Chinese Journal of Inorganic Chemistry 无机化学学报
（11）Acta Polymerica Sinica 高分子化学学报
（12）Chinese Journal of Catalysis 催化化学
（13）Analysis Laboratory 分析试验室
（14）Chinese Journal of Chromatography 色谱
（15）Molecular Catalysis 分子催化
（16）Journal of Instrumental Analysis 分析测试学报
（17）Computers and Applied Chemistry 计算机与应用化学
（18）Chemical Research and Application 化学研究与应用
（19）Progress in Chemistry 化学进展
（20）Journal of Electrochemistry 电化学
（21）Journal of Functional Polymers 功能高分子学报
（22）Chinese Journal of Chemistry 中国化学（英文版）
（23）Journal of Molecular Science 分子科学学报
（24）University Chemistry 大学化学
（25）Chemical Education 化学教育

（26）Science
（27）Nature
（28）Nature Materials
（29）Nature Nanotechnology
（30）Nano Letters
（31）Advanced Materials
（32）Journal of the American Chemical Society
（33）Physical Review Letters
（34）Chemical Communications
（35）Chemistry of Materials
（36）Journal of Materials Chemistry
（37）Carbon
（38）Crystal Growth & Design
（39）Angewandte Chemie International Edition
（40）Langmuir
（41）Journal of Applied Crystallography
（42）Acta Materialia
（43）Applied Physics Letters
（44）Physical Chemistry Chemical Physics
（45）Nanotechnology
（46）Physical Review B
（47）The Journal of Physical Chemistry A
（48）Journal of power sources
（49）Journal of the Electrochemical Society
（50）Journal of Solid State Chemistry
（51）Materials Chemistry and Physics
（52）Advances in Water Resources
（53）Environmental science & technology
（54）Field analytical chemistry and technology
（55）Talanta

(0707) Ocean Science Training Program for International Postgraduates

(0707)海洋科学　硕士留学生　培养方案

一、Training Goal 培养目标

Students should support the CPC, love their motherland, abide by laws and regulations, have good moral character, maintain a rigorous academic attitude, and have a dedicated spirit during the pursuit of truth and commitment to the field of marine science, along with academic literacy and ethical standards. Through systematic training in professional knowledge, research methods, and experimental skills, students are cultivated to have good background in marine science. The research is focus on marine geology, marine environment, and marine resource exploration with connections to other disciplines. Students will understand the development trends and research frontiers of this field, and be proficient in using computers and foreign languages as tools to gather information, conduct work, and engage in external communication. They will possess the abilities required for research, teaching, technical, and business management roles, and be adept at applying their knowledge and skills to solve practical problems and technical needs related to the socio-economic development of marine science.

培养学生拥护中国共产党，热爱祖国、遵纪守法、品德优良、学风严谨，具有追求真理和献身于海洋科学事业的敬业精神，具有学术素养和学术道德。通过系统的专业知识、研究方法和实验技能的培训，培养学生具有良好海洋科学专业基础；研究方向以海洋地质、海洋环境及海洋资源勘查为重点，向其他学科辐射。了解本学科的发展趋势和研究前沿，能熟练的应用计算机和外语两项工具收集信息、开展工作和对外交流，具有科研、教学、技术和业务管理工作的能力，善于运用自己的知识和技能解决海洋科学相关的社会经济发展的实际问题和技术需求。

二、Research Directions 研究方向

Research Directions 研究方向	Research Content 研究内容
Marine Geology 海洋地质	The scientific study of the evolution history of marine environments, the formation processes of marine resources, and the role of the ocean in the evolution of the Earth system is an important component of Earth system science and fundamental research on resources and the environment. Based on geological and oceanographic theories and methods, this research investigates the structural characteristics, material composition, and evolutionary patterns of seabed sediments and the solid Earth. It aims to reveal the interaction and coupling mechanisms between seabed sediments, the solid Earth, the hydrosphere, and the biosphere, as well as the resulting responses in resources and the environment. 研究海洋环境演化历史、海洋资源形成过程以及海洋在地球系统演化中作用的科学，是地球系统科学和资源环境基础研究的重要组成部分。以地质学和海洋学理论方法为基础，研究海底沉积物与固态圈层的结构特征、物质组成和演化规律，揭示海底沉积物与固态圈层、水圈和生物圈相互作用和耦合机理，以及由此产生的资源和环境响应。
Ocean Resources	Conduct research on the formation conditions, mineralization mechanisms, enrichment

	patterns, and other fundamental theories, detection methods, and evaluation technologies related to marine oil and gas in marginal seas, deep water, and ultra-deep water, as well as natural gas hydrates, polymetallic nodules, hydrothermal sulfides, and rare earth muds. Promote the development of marine big data and digital mining area platforms, advance smart ocean initiatives, and integrate theory with practice to support the national global ocean strategy objectives. 开展边缘海、深水和超深水海洋油气、天然气水合物、多金属结核、热液硫化物、稀土软泥等的形成条件、成矿机理、富集规律等的基础理论、探测方法和评价技术研究，以及上述矿产的开采、开发技术、设备研制等。推进海洋大数据、数字矿区平台建设，发展智慧海洋，理论和实践相结合，服务国家全球海洋战略目标。
Marine Organism	The diversity, functions, and ecology of marine organisms are explored. The focus is on the evolutionary processes of life in the ocean, the classification and distribution characteristics of organisms, and the relationships between organisms and their environment within ecosystems. Research is particularly directed towards the coastal zone and deep-sea environments (such as hydrothermal and cold seep areas), including the selection of biological indicators, (micro)bioremediation technologies, and studies related to biogeochemical coupling mechanisms. This research aims to provide a scientific basis for the development of biological resources, the health of marine ecosystems, and sustainable human development. 海洋生物的多样性、功能和生态三方面的内容。关注海洋中生命的演化过程、生物分类和分布特征、生态系统中生物之间以及生物与环境的关系。重点针对海岸带和深海环境（如热液区和冷泉区等）开展生物指标筛选、（微）生物修复技术以及地生耦合机制相关研究，为生物资源开发、海洋生态系统的健康和人类可持续发展提供科学依据。
Marine Chemistry	The field of marine chemistry primarily studies the distribution, migration, cycling, and enrichment patterns of chemical elements and their isotopes within marine systems. It examines various macro and micro chemical processes in the ocean, such as the exchange of materials between the ocean and the atmosphere, as well as the chemical fluxes and processes among different components of the marine system (including seawater, organisms, seabed sediments, and rocks). Additionally, it investigates issues related to the development and utilization of chemical resources from seawater, organisms, and seabed sediments, as well as marine environmental protection. 海洋化学方向主要研究海洋体系中化学元素及其同位素的分布、迁移、循环与富集规律。海洋中各种宏观及微观化学过程如海洋和大气间的物质交换过程、海洋体系各组成部分之间（如海水、生物体、海底沉积物及岩石等）的化学通量和化学过程等。还研究从海水、生物体和海底沉积层中开发利用化学资源及海洋环境保护等问题。
Physical Oceanography	Master the fundamental theories, basic experiments and observation techniques, and computer numerical simulation methods of physical oceanography, and conduct innovative research in this field. The subfields include ocean remote sensing, Earth system numerical simulation, polar physical oceanography, and the development of ocean observation equipment. The main focus is on research related to ocean remote sensing technology and applications, the development of high-resolution Earth system models, the development of advanced deep-sea observation equipment, the mechanisms and processes of ocean disasters, and the cryosphere and global change. 掌握物理海洋学的基础理论、基本实验和观测技术、计算机数值模拟方法，进行

	具有一定创新的物理海洋学研究。下设海洋遥感、地球系统数值模拟、极地物理海洋与海洋观测设备研发等子方向。主要关注海洋遥感技术与应用、高分辨率地球系统模式研发、深海高端观测设备研发、海洋灾害机理及过程、冰冻圈与全球变化等方面的研究。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	
	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	32	2	Autumn 秋季	School of Earth Sciences and Resources 地球科学与资源学院	
	M311005	Marine Geology （Senior） 高级海洋地质学	32	2	Spring 春季	School of Ocean Sciences 海洋学院	Core and Compulsory 核心课程必选

Optional Courses 专业选修课	B21311002	Marine Geology Frontiers 海洋地学前沿	48	3	Autumn 秋季	School of Ocean Sciences 海洋学院	≥6credits 不少于 6 学分
	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	
	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	
	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	
	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	
	X21306001	Advances in Oil and Gas Field Development 油气田开发科技进展	48	3	Spring 春季	School of Energy Resources 能源学院	
	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	——	
	Subject Practice 专业实践			2			
	Thesis Proposal 论文开题报告			——			
	Thesis Progress Report 论文中期报告			——			

	Academic Presentation 作学术报告		——			

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

专著:

1. Deep marine systems: processes, deposits, environments, tectonics and sedimentation，Pickering，Kevin T，and Richard N. Hiscott，John Wiley & Sons，2015，ISBN：9781405125789.
2. Introduction to marine biogeochemistry，Libes, Susan，Academic Press，2011，Second Edition，ISBN：9780120885305.
3. Marine geochemistry，Schulz H D，Zabel M，Second Edition，updated and extended edition，Springer Berlin Heidelberg New York，2006，ISBN：10 3-540-32143-8.
4. Sedimentology and Stratigraphy，Second Edition，Gary Nichols，2009，Wiley-Blackwell
5. Silent spring，Carson R，Houghton Mifflin Harcourt，2002，ISBN：9780618249060.
6. Treatise on Geochemistry，H D Holl and Turekian K K，2014，Second Edition，ISBN：9780080437514.
7. 地球系统与演变，汪品先，田军，黄恩清，马文涛 著，科学出版社，2018，ISBN：9787030576040.
8. 认识海洋，魏友云 译，福建教育出版社，原文 An introduction to the World's Oceans，10th Edition，Keith A Sverdrup and E Virginia Armbrust，2020，ISBN：7533485769.
9. 污染水文地质学，Fetter C W 著，周念清、黄勇 译，周志芳 校，高等教育出版社，2011，ISBN：9787040324549.
10. 水文学手册，David R Maidment 主编，张建云、李纪生 等译，科学出版社，2002，ISBN：9787030104496.
11. 海洋恢复生态学，李永琪 等著，中国海洋大学出版社，2016，ISBN：9787567010826.
12. 海洋微生物学，张晓华 等著，科学出版社，2016，ISBN：9787030494252.
13. 物理海洋学（第六版），琳恩·塔利（Lynne D. Talley）、佐治·皮卡德（George L. Pickard）、威廉·埃梅里（Willian J. Emery）、詹姆斯·斯威夫特（James H. Swift）著，张恒 译，中山大学出版社出版，ISBN：978-7-306-06303-8.
14. 生物海洋学（第二版），查尔斯·米勒，帕丽夏·惠勒 著，龚骏 译，中山大学出版社出版，ISBN：978-7-306-06600-8.
15. 大洋钻探五十年，中国大洋发现计划办公室，海洋地质国家重点实验室（同济大学） 编著，同济大学出版社，2018-11，ISBN：9787560882093.
16. 海陆的起源，魏格纳 (著)，李旭旦(译)，北京大学出版社，2006-11，ISBN：9787301095577.
17. 南极洲地质发展与冈瓦纳古陆演化，陈廷愚、沈炎彬、赵越、任留东著，商务印书馆，2008，ISBN：9787100053099.
18. 朱夏论中国含油气盆地构造，朱夏 著，北京：石油工业出版社，1986，ISBN：9787518339518.
19. 中国含油气沉积盆地论，田在艺、张庆春 著，北京：石油工业出版社，1996，ISBN：9787502118105.
20. 油气圈闭圈闭勘探，国外油气勘探开发新进展丛书（一）美爱德华 A. 博蒙特 主编，北京：石油工业出版社，2002，ISBN：9787502136635.
21. 层序地层学原理，国外油气勘探开发新进展丛书（六）奥克塔文，卡图泥鲁 著，北京：石油工业出版社，2009，ISBN：9787502170752.
22. 含油气系统—从烃源岩到圈闭，Magoon L B，Dow W G 等著，张刚 等翻译，北京：石油工业出版社，1998，ISBN：9787502122386.

23. 中国近海大油气田，龚再升 等著，北京：石油工业出版社，1997，ISBN：9787502121327.
24. 全球构造演化与含油气盆地（代总论），朱伟林，李江海，崔旱云 等著，北京：科学出版社，2014，ISBN：9787030407269.
25. 中国烃源岩，秦建中 等著，北京：科学出版社，2005，ISBN：9787030152848.
26. 中国含油气盆地图集（第二版），李国玉，吕鸣岗 等编著，中国国际广播音像出版社，2016，ISBN：9787899940822.
27. 中国前中生代构造—岩相古地理图集，郑和荣和胡宗全 主编，北京：地质出版社，2010，ISBN：9787116069350.

期刊:

1. Nature Geoscience
2. Nature Climate Change
3. Geology
4. Earth and Planetary Science Letters
5. Journal of Geophysical Research: Oceans
6. Journal of Geophysical Research: Solid Earth
7. Geophysical Research Letters
8. Geochemistry, Geophysics, Geosystems
9. Geochimica et Cosmochimica Acta
10. Palaeogeography, Palaeoclimatology, Palaeoecology
11. Paleoceanography and Paleoclimatology
12. Water Resource Research
13. Environmental Science & Technology
14. Cryosphere
15. Geoscientific Model Development
16. Ocean Modelling
17. Remote Sensing of Environment
18. ISME Journal
19. Marine Drugs
20. Journal of Natural Products,
21. Phytochemistry
22. Tetrahedron Letters
23. Journal of Antibiotics
24. 中国科学（D 辑）
25. 第四纪研究
26. 海洋地质与第四纪地质
27. 海洋学报
28. 海洋科学

(0708) Geophysics Training Program for International Master Student

(0708) 地球物理学 硕士留学生 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 the Mathematics, Physics, Geology, and Computer Science, master the basic theories, professional knowledge and skills of Geophysics, understand the trends of development and the academic frontiers of Geophysics, have the ability to carry on the scientific research and academic communication; could undertake the general research subject independently and produce the innovative achievements in one aspect, undertake the teaching, research, and management 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；具有扎实的数学、物理、地质学、计算机技术等基础知识，掌握系统的地球物理学基本理论、专业知识和技能，了解地球物理学领域的发展趋势和学术前沿，具有开展科学研究和学术交流的能力，能够独立承担本学科的一般研究课题并做出一定的创新成果，能够在深地、深海、深空以及资源、环境、工程等领域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.深部地球物理 Deep Geophysics	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。
2.海洋地球物理 Marine Geophysics	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。
3.空间物理 Space Geophysics	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。
4.勘探地球物理 Exploration Geophysics	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。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	
	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	32	2			
	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
Optional Course 专业 选修课	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	≥6 credits 不少于 6 学分
	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	
	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	Spring	School of Geophysics and Information Technology 地球物理与信息技术学院	
	X21312002	Space Geodesy 空间大地测量	16	1		土地科学技术学院 School of Land Science and Technology	
	B21301003	Advanced tectonic geology 高级构造地质学	32	2		地球科学与资源学院 School of Earth Sciences and Resources	
	X21314001	Taijiquan(24-forms) 24 式简化太极拳	16	1		Department of P. E. 体育部	必选 Compulsory
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	——	
	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：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 Master Student

(0709) 地质学 硕士留学生 培养方案

一、Training Goal 培养目标

The master's degree program is adhered to the guideline of "targeting major national demands and the frontiers of earth science and technology". The program emphasizes students' academic ethics, original and integrated creativity, learning capabilities, academic communication capabilities, teamwork vitality, patriotism, and social responsibility, and is aimed to strengthen individuals' interest in earth sciences research, enhance their understanding of academic research and norms, sophisticate their ability to apply the fundamental theories and knowledge of geology, develop their geological field and laboratory skills, and open their academic insight. The program is designed to prepare students to meet the challenge of research questions in earth sciences, and for research, technique, and management positions in the field of geology.

本学科始终坚持以"面向国家重大需求和国际地球科学技术前沿"为指导思想，以恪守学术道德、具有原始创新和集成创新能力、较好的学习能力、学术交流能力、团队合作精神、家国情怀和社会责任感为人才培养的重点内容，侧重培养对于地质学领域的科学研究有浓厚兴趣，对于学术研究和规范有深刻理解，能够较熟练运用地质学基础理论和知识，独立开展野外地质工作或熟练掌握基本的实验技术，具备一定的学术洞察力，能够针对地质学领域的科学问题提出解决方案并最终实现研究目标，独立从事地质学科学研究、技术研发和管理的科技创新型拔尖人才和高层次工程技术人才。

二、Research Directions 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, metamorphic petrology, regional mineral deposit geology, mineral deposit geology, etc. 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. 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。
2.Geochemistry 地球化学	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

Research Direction 研究方向	Research Content 研究内容
	units. The main research fields include isotope geochemistry, environmental geochemistry, exploration geochemistry, computational-experimental and fluid geochemistry, etc. 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. 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。
3.Paleontology and Stratigraphy（including Paleoanthropology 古生物学与地层学（含古人类学）	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. Features and advantages: research in the theory and practice of integrative stratigraphy, earth history, and major geological events. 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。
4.Structural Geology 构造地质学	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. 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. 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。

Research Direction 研究方向	Research Content 研究内容
5.Quaternary Geology 第四纪地质学	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. Features and advantages: research on Quaternary environmental evolution, geo-tourism resource evaluation and planning, neotectonics and geological disasters, etc. 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。
6.Gemology 宝石学	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, 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. Features and advantages: this subject relies on the theoretical and technical advantages of the subject 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. 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。
7.Hydrogeology 水文地质学	Thissubject 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. Features and advantages: ecological hydrogeology, environmental hydrogeology, pollution hydrogeology, earthquake hydrogeology, mining hydrogeology, etc. 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

Research Direction 研究方向	Research Content 研究内容
	等方面。
8.Planetary Science and Comparative Planetology 行星地质与比较行星学	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. Features and advantages: research on the geological evolution of the moon. 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。
9.Geobiology 地球生物学	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. Features and advantages: research on co-evolution of life and environment during major geological catastrophic periods, microbial processes, and global changes, etc. 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个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。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for Master and Ph.D. student are interconnected, and in general each credit is equivalent to 16 class hours.
来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	
	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	32	2	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	≥8credits 不少于 8 学分
	B21501001	High-temperature geochemistry and cosmochemistr 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	
	X21305003	Hydrogeochemical processes and PHREEQC modeling 水文地球化学过程与 PHREEQC 模拟	32	2	Spring 春季	Water Resources and Environment 水资源与环境学院	
	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	

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**
	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	
	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	——	
	Subject Practice 专业实践			2			
	Thesis Proposal 论文开题报告			——			
	Thesis Progress Report 论文中期报告			——			
	Academic Presentation 作学术报告			——			

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. 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.

5. Zhai, Y., Theory of Metallogenic System, Geological Publishing House, 2010.

翟裕生，成矿系统论，地质出版社，2010.

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

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

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

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

10. Robb LJ., Blackwell., Introduction to ore-forming processes, Blackwell Pub., 2005.

Geochemistry

地球化学方向

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

12. Andrews J.E., Brimlecombe P, Jickells T.D., Liss P.S., Reid B., An Introduction to Environmental Chemistry, Blackwell publishing, Second Edtion, 2004.

13. Faur G., Principle of Isotope Geology, New York: John Wiley& Sons, 1986.

14. Joechem H., Stable isotope geochemistry, Springer, 2004.

15. Faure G., Principles and applications of Geochemistry, 2nd ed., Cambridge University Press, 1998.

16. Treatise on Geochemistry Elsevier, 2003.

17. 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

18. 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.

19. Michael F., Miller A.I., Raup D.M., Stanley S.M., Freeman W.H., Principles of Paleontology, 2007.

20. Hammer A., Harper, D.A.T., Paleontological Data Analysis, Wiley-Blackwell, 2008.

21. Armstrong H.A., Brasier M.D., Microfossils, 2nd ed., Oxford: Blackwell, 2005.

22. Benton M.J., Vertebrate Paleontology, 3rd ed., Oxford: Blackwell, 2005.

23. Emery D., Myers K., Concepts and Principles of Sequence Stratigraphy, Blackwell, 1996.

24. Charmley H., Sedimentology, Springer, 1990.

25. Busby C.J., Ingersoll R.V., Tectonics of Sedimentary Basins, Blackwell, 1995.

26. Miall, A.D., Principles of Sedimentary Basin Analysis, Springer, 2000.

27. Gradstein, F.M., Ogg, J.G., Schmitz, M.D. , Ogg, G.M., Geological Time Scale. Amsterdam: Elsevier, 2020

Structural Geology

构造地质学方向

28. Wan, T., The Tectonics of China, Geological Publishing House, July 2011.

万天丰，中国大地构造学，地质出版社，2011 年 7 月.

29. Wan Tianfeng，The Tectonics of China，Springer，2011 年 5 月

30. Zonenshain L.P., Kuzmin M.I., Natapov L.M., Geology of the USSR: a plate-tectonic synthesis, Geodynamics series, Vol. 21, 1990.

31. Passchier C.W., Trouw R.A.J., Microtectonics, Springer, 2nd edition, 2005.

32. Fossen H., Structural Geology, Cambridge University Press, 2005.

33. Van der Pluijm B.A., Marshak S. Earth Structure, McGraw-Hill Company, 2004.

34. Kearey P., Klepeis A.K., Vine J. F., Global Tectonics, Wiley-Blackwell, 3rd Edition, 2008.

35. Turcotte L.D., Schubert G., Geodynamics, Cambridge University Press, 3rd Edition, 2002.

36. Allen A.P., Allen R.J., Basin Analysis: Principles and Application to Petroleum Play Assessment-3rd Edition,

Wiley-Blackwell, 2013.

37. Busby C., Azor A., Tectonics of Sedimentary Basins, Wiley-Blackwell, 2012.
38. 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

39. 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.

40. 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.

41. 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.

42. Tian, M. & Cheng, J., Quaternary Geology and Geomorphology. Beijing: Geological Publishing House, 2020.

田明中，程捷主编，第四纪地质学与地貌学. 北京：地质出版社，2020.

43. Lowe J.J.，Walker M.J.C. 编著，沈吉，于革，吴敬禄等译，第四纪环境演变，科学出版社，2010.
44. An Z.S., Late Cenozoic Climate Change in Asia, Springer Dordrecht Heidelberg New York London, 2014.
45. Gallagher, K., Wainwright J., Landscape evolution: denudation, climate and tectonics over different time and space scales, Geological Society of London, 2008.
46. Derbyshire E., Hails J.R., Gregory K.J., Geomorphological Processes: Studies in Physical Geography, Elsevier, 2013.
47. Raymond S. Bradley. Paleoclimatology-Reconstructing Climates of the Quaternary. Academic Press, 2015.
48. Ruddiman W., Earth's Climate Past and Future, Second Edition, 2007.

Gemology

珠宝学方向

49. Yu, X., Colored Gemology Course (Second Edition), Geological Publishing House, 2016.

余晓艳，有色宝石学教程（第二版），地质出版社，2016.

50. Guo, Y., Jade Carving and Jade Articles, Seismological Press, 2007.

郭颖，玉雕与玉器，地震出版社，2007.

51. Zhang, B., Systematic Gemology (Second Edition), Geological Publishing House, 2006.

52. 张蓓莉，系统宝石学（第二版），地质出版社，2006.

53. 《Gem and Ornamental Materials of Organic Origin》,Maggie Campbell Pedersen, NAG Press, 2010
54. 《Gemmology》. Peter G. Read, Elsevier, 2005
55. 《Gemology》, Cornelius S. Hurlbut &Robert C. Kammerling, John Wiley, 1991

Hydrogeology
水文地质学方向

56. Chinese Academy of Sciences, Groundwater Science, Science Press, 2018.

中国科学院，地下水科学，科学出版社，2018.

57. Cao, W., Wan, L., & Hu, F., Regional Hydrogeology of China, Geological Publishing House, 2011.

曹文炳，万力，胡伏生，中国区域水文地质，地质出版社，2011.

58. Fetter C.W., Pollution Hydrogeology, Higher Education Press, 2011.

Fetter C.W. 著，周念清、黄勇译，周志芳 校，污染水文地质学，高等教育出版社，2011.

Planetary Science and Comparative Planetology
行星地质与比较行星学方向

59. 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.

60. Chen, J., Lunar Geology Research and Map Editing, Geological Publishing House, Beijing, 2014.

陈建平等，月球地质研究与编图，地质出版社，北京，2014.

61. A. E. Ringwood, Origin of the Earth and Moon, Springer-Verlag New York Inc, 1979

62. Bradley L. Jolliff, Mark A. Wieczorek, Charles K. Shearer, and Clive R. Neal，New views of the Moon, Mineralogical Society of America Geochemical Society, 2006.

63. Charles J. Byrne, The Moon’s Near Side Megabasin and Far Side Bulge, Springer, 2013.

64. Erik M. Galimov, Anton M. Krivtsov, Origin of the Moon. New Concept, Deutsche National bibliothek, 2012.

65. Grant H. Heiken, David T. Vaniman, and Bevan M. French, Lunar Soucebook: A User’s Guide to the Moon, Cambridge University Press, 1991.

66. H. J. Melosh, Impact Cratering: A Geologic Process, Oxford University Press, 1989.

67. Michael H. Carr, R. Stephen Saunders, Robert G. Strom, and Don E. Wilhelms, The Geology of the Terrestrial Planets, Scientific and Technical Information Branch, 1984.

68. Raffaello Lena, Lunar Domes Properties and Formation Processes, Springer, 2013.

Biogeology

地球生物学方向

69. Chinese Academy of Sciences, Geobiology, Science Press, 2015.

中国科学院，地球生物学，科学出版社，2015.

70. Dong, H., Jiang, H., Geological Microbiology, Higher Education Press, 2021.

董海良，蒋宏忱，地质微生物学，高等教育出版社，2021.

71. Wang, P., Tian, J., Huang, E., & Ma, W., Earth System and Evolution, Science Press, 2018.

汪品先，田军，黄恩清，马文涛，地球系统与演变，科学出版社，2018.

72. Chameides W. L., Perdue E. M. (author), Zhang Jing (translated), Biogeochemical Cycle, Higher Education Press, 2012.

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.

2. Professional Journals (in alphabetical order)

（二）专业学术期刊目录（按英文字母排序）

1. Acta Geologica Sinica

地质学报（英文版）

2. Acta Micropalaeontologica Sinica

微体古生物学报

3. Acta Mineralogica Sinica

矿物学报

4. Acta Palaeontologica Sinica

古生物学报

5. Acta Petrologica et Mineralogica

岩石矿物学杂志

6. Acta Petrologica Sinica

岩石学报

7. Acta Scientiae Circumstantiae

环境科学学报，CNKI

8. Acta Sedimentologica Sinica

沉积学报

9. American Mineralogist
10. Annual Review of Astronomy and Astrophysics
11. Annual Review of Earth and Planetary Sciences
12. Applied Environment Microbiology, American Society for Microbiology
13. Basin Research
14. Bioresource Technology
15. Carbonate sedimentology
16. Chemical Geology
17. Chinese Science Bulletin

科学通报（英文版）

18. Earth and Planetary Physics

地球与行星物理（英文版）

19. Earth and Planetary Science Letters
20. Earth Moon and Planets
21. Earth Planets and Space
22. Earth-Science Reviews
23. Economic Geology
24. Environmental Science & Technilogy，American Chemical Society
41. Geobiology
42. Geochimica et Cosmochimica Acta
43. Geological Society of America Bulletin
44. Geology
45. Geology in China

中国地质

46. Geomorphology
47. Geoscience

现代地质

48. Geoscience Frontiers

地学前缘（英文版）

49. Ground Water

50. Hydrogeology and Engineering Geology

水文地质工程地质

51. Icarus

52. Lethaia

53. IEEE Transactions on Geoscience and Remote Sensing

54. Lithos

55. Mineralium Deposita

56. Journal of Contaminant Hydrology

57. Journal of Earth Science

地球科学学刊（英文版）

58. Journal of Gems & Gemmology

宝石及宝石学杂志

59. Journal of Geophysical Research-Solid Earth

60. Journal of Paleontology

61. Journal of Petrology

62. Journal of Sedimentary Research

63. Journal of Structural Geology

64. Mineral Deposits

矿床地质

65. Nature

66. Nature Geoscience

67. Ore Geology Reviews

68. Palaeogeography Palaeoclimatology Palaeocology

69. Paleobiology

70. Planetary and Space Science

71. Precambrian Research

72. Quaternary Geochronology

73. Quaternary International

74. Quaternary Research

75. Quaternary Sciences

第四纪研究

76. Quaternary Science Reviews

77. Science

78. Science China, Earth Sciences

中国科学：地球科学（英文版）

79. Sedimentary Geology

80. Sedimentology

81. Tectonics

82. Tectonophysics

83. The Holocene

84. Vertebrata Palasiatica

古脊椎动物学报

85. Water Research

86. Water Resource Research

(0710) Biology Training Program for International Master Student

(0710) 生物学 硕士留学生 培养方案

一、Training Goal 培养目标

The master's degree in biology is based on the building of morality, and cultivate peoples advocacy for science who are honesty and trustworthy, friendly to China, have good scientific literacy and cooperative spirit, have rigorous style of study, humble, enterprising, dedicated, and a strong sense of career and social responsibility , possess solid and broad basic theories of biology, systematic professional knowledge and experimental scientific research skills, meet the needs of the international job market, and be professionals engaged in teaching, scientific research, production, environmental protection, scientific and technological management of biology and other related disciplines.

生物学硕士学位点以立德树人为根本，培养崇尚科学，诚实守信，对华友好，具有良好的科学素养和合作精神，学风严谨，谦虚、进取、敬业，有较强的事业心和社会责任感，具备扎实宽广的生物学基础理论、系统的专业知识和实验科研技能，符合国际就业市场需求，具有从事生物学及相关学科的教学、科研、生产、环境保护及科技管理等方面工作的高级专业人才。

二、Research Directions 研究方向

Research Direction 研究方向	Research Content 研究内容
1. Applied Biology and Environmental Remediation 应用生物学与环境修复	Applying biological principles and methods to study and solve related scientific problems in water and soil environmental management, the research focuses on the process and mechanism of interaction between microorganisms and the environment, the interaction between wetland and the environment and its response, and phytoremediation technology for heavy metal contaminated sites. Provide scientific basis and key technologies to ensure the sustainable development of ecology and environment. 应用生物学原理和方法研究解决水土环境治理的相关科学问题，重点开展微生物与环境的相互作用过程及机理、湿地与环境相互作用及其响应、重金属污染场地的植物修复技术等方面的研究，为保障生态与环境的可持续发展提供科学依据与关键技术。
2. Geological Microbiology 地质微生物学	Based on ecosystems with typical geological significance, the research focuses on the functions of microbial communities and their mediated biogeochemical cycles by them, focusing on the interaction mechanism, processes and environmental effects between microorganisms and minerals, as well as the geological effects of microorganisms in extreme environments, etc. 立足具有典型地学意义的生态系统，重点开展微生物群落功能以及其介导的生物地球化学循环过程等方面的研究，重点关注微生物与矿物相互作用机理、过程及环境效应、极端环境微生物的地质作用等。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	
	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	32	2			
	X21305001	Remediation of Groundwater Pollution 地下水污染修复	16	1	Autumn	School of Water Resources and Environment 水资源与环境学院	≥2 credits 不少于 2 学分
	X21305002	Uncertainty Analysis for Groundwater Flow Modeling 地下水模拟不确定性分析	16	1	Autumn	School of Water Resources and Environment 水资源与环境学院	

Optional Course 专业选修课	B21301004	Global change and Geomicrobiology 全球变化与地球微生物学	16	1		School of Earth Science and Resources 地球科学与资源学院	≥6 credits 不少于 6 学分
	X21305003	Hydrogeochemical processes and PHREEQC modeling 水文地球化学过程与 PHREEQC 模拟	32	2		School of Water Resources and Environment 水资源与环境学院	
	X21305004	Hydrological Processes and Modeling 水文过程与模拟	32	2		School of Water Resources and Environment 水资源与环境学院	
	X21305005	Numerical Methods in Geotechnics 岩土工程数值模拟方法	16	1		School of Water Resources and Environment 水资源与环境学院	
	X21307007	Resource and Environmental Economics 资源环境经济	32	2		School of Economics and Management 经济管理学院	
	X21307008	Resource and Environmental Management 资源环境管理	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	——	
	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：Public Courses 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。

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. Biogeochemistry，Elsevier
3. Bioresource Technology，Elsevier
4. Chemical Engineering Journal，Elsevier
5. Environmental Conservation，Elsevier
6. Environmental Pollution，Elsevier
7. Environmental Science & Technology，American Chemical Society
8. Environmental Toxicology，Elsevier
9. Geomicrobiology Journal，Elsevier
10. Journal of Hazardous Materials，Elsevier
11. Nature，Nature Group
12. Nature Communications，Nature Group
13. Science of the Total Environment，Elsevier
14. Soil Biology and Biochemistry，Elsevier
15. Water Research，Elsevier
16. Water Resource Research，American Geophysical Union
17. 环境科学，CNKI
18. 环境科学学报，CNKI
19. 科学通报，中国科学院
20. 土壤学报，CNKI
21. 微生物学报，CNKI
22. 中国环境科学，CNKI

(0815) Hydraulic Engineering Training Program for International Master Student

(0815) 水利工程 硕士留学生 培养方案

一、Training Goal 培养目标

The Master's degree programs of hydraulic engineering is aimed at training qualified professional 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 basic theories, methods and techniques in hydraulic engineering, understanding the properties and roles of groundwater, working smoothly in scientific writing and international academic communications, achieving practical experiences of case studies and technology applications in hydraulic engineering. Graduated Master students are adequate for jobs of hydraulic engineering management, teaching or project design in government departments, education institutions or enterprises.

水利工程硕士学位点学科致力于培养水文科学与水资源管理领域的高级专业人才，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基本理论和技术方法，理解地下水的特性和作用，胜任科技论文写作和国际学术交流，有水利工程案例研究和技术应用的实践经验。毕业硕士能够在政府管理部门、科研教育机构或企业承担水利工程领域的管理、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	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. 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。
2. Groundwater Sciences and Engineering 地下水科学与工程	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. 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。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	
	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	32	2			
	X21305004	Hydrological Processes and Modeling 水文过程及其模拟	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
	X21305002	Uncertainty Analysis for Groundwater Flow Modeling 地下水模拟不确定性分析	16	1	Autumn	School of Water Resources and Environment 水资源与环境学院	

Optional Course 专业选修课	X21305001	Remediation of Groundwater Pollution 地下水污染修复	16	1	Autumn	School of Water Resources and Environment 水资源与环境学院	≥6 credits 不少于 6 学分
	X21302001	FIDIC Conditions of Contract for Construction 菲迪克条款与项目管理	32	2		School of Engineering and Technology 工程技术学院	
	X21307008	Resource and Environmental Management 资源环境管理	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	
	B21301027	Formation and Evolution of a Habitable Earth 宜居地球的形成和演化	32	2		School of Earth Science and Resources 地球科学与资源学院	
	X21312002	Space Geodesy 空间大地测量	32	2		School of Land Science and Technology 土地科学技术学院	
	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	——	
	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：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
18. 水科学进展, CNKI
19. 水文地质工程地质, CNKI
20. 水动力学研究与进展, CNKI

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

(0816) 测绘科学与技术 硕士留学生培养方案

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 space information's acquisition, processing and comprehensive analysis, and understand the latest information of the development of scientific and technological in the Chinese 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，具备良好道德品质，了解近代测绘科学与技术的进展与动态，面向我社会发展所需的测绘地理信息专业研究型人才。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，了解从事研究方向的国内外科技发展的最新动态；

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	To study the shape and gravity field of the earth and its neighboring stars and their time-varying regulations, as well as the precise determination of space point positions and deformation monitoring. The main research areas include: multiple systems GNSS precise positioning

工程	and gravity measurement, GNSS ionosphere/troposphere inversion, GNSS/INS and other multiple sources sensors seamless indoor and outdoor positioning technology, satellite orbit determination, precision engineering and industrial surveying, geological disaster monitoring and parameter inversion and other theories and methods. 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：多系统 GNSS 精密定位与重力测量，GNSS 电离层/对流层反演，GNSS/INS 等多源传感器室内外无缝定位技术、卫星定轨、精密工程与工业测量、地质灾害监测及其参数反演等理论与方法等。
2.Photographic surveying and remote sensing 摄影测量与遥感	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、室内外场景建模、遥感大数据智能解译、资源环境与行星遥感及地学应用等。
3.Cartography and geographic information engineering 地图制图学与地理信息工程	To study the storage, processing, analysis, management and application of geographic space information, and develop and establish the method of geographic information systems. The main research areas include: map design and compilation, collection of multivariate geographic data, information visualization, spatial analysis and modeling, virtual geographic environment, data mining and knowledge discovery, GIS software engineering, etc. 研究地理空间信息存储、处理、分析、管理和应用，开发与建立地理信息系统的方法。主要研究内容包括：地图设计与编绘、多元地理数据的采集、信息可视化、空间分析建模、虚拟地理环境、数据挖掘与知识发现、GIS 软件工程等。
4.Geographic space intelligence 地理空间智能	To research and develop the dynamic perception and intelligent reasoning ability of spatial intelligence on geographical phenomena and earth science processes. The main research areas include: urban dynamic change prediction, intelligent transportation decision-making, intelligent prediction and risk assessment of natural disasters, spatial big data analysis, smart city and smart earth, etc. 研究与开发空间智能对地理现象和地球科学过程的动态感知、智能推理的能力，主要研究内容包括：城市动态变化预测、智能交通决策、自然灾害智能预测与风险评估、空间大数据分析、智慧城市与智慧地球等。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of

study period is 4 years, and the credits should be no less than 31. 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	
	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	32	2	Autumn		
	X21312002	Space Geodesy 空间大地测量	16	1	Autumn		≥2 credits 不少于 2 学分
	X21312001	Progress in Surveying and Mapping Science and Technology 测绘科学与技术进展	32	2	Spring		
Optional Course 专业选修课	S21312040	Planetary Geologic Mapping 行星地质制图	32	2	Spring	School of Land Science And Technology 土地科学技术学院	≥6 credits 不少于 6 学分
	S21312030	LiDAR Technology and 3D Modelling LiDAR 技术与三维建模	32	2	Spring		
	S21312037	Analysis and Application of the Big Data of Remote Sensing Image	32	2	Spring		

	S21304001	Frontiers of Information Technology	16	1	Spring	School of Engineering and Technology 信息工程学院	
	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	——	
	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：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

Book:
著作：
1. Design and Implementation of Geographic Information System. Xincai 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 Imagine 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. Xincai 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. Xincai 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》闾国年等，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, Honglei Yang, 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 Master Student

(0818)地质资源与地质工程 硕士留学生培养方案

一、Training Goal 培养目标

Degree recipients 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, and have good scientific research ethics and professionalism. Research in this major is focused on theories, technology and methods of forecasting, prospecting, evaluation, and development of various mineral resources, aiming to optimize the comprehensive benefits of geology, resources, environment, technology, and economics. The trained international graduate students should be able to skillfully read Chinese and foreign materials of mineral survey and exploration, and have the ability of academic exchange. Degree recipients should also have knowledge of the development trend and research frontiers of mineral resource prospecting and exploration, be able to independently conduct general research in this discipline, and have the ability to apply the theories, methods, and modern technologies of earth sciences (geology, geochemistry, geophysics, remote sensing) to research, teaching, or management works related to the internal structure of the earth, earth dynamics and evolution, resource exploration and development, environmental and engineering exploration, digital mines, etc. Chinese proficiency requires a preliminary ability to use life language and read Chinese materials on geological resources and geological engineering.

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。该 学科以各类资源矿产为研究对象，以矿产预测、勘查、评价及开发利用的理论、技术和方 法为研究内容，以地质、资源、环境、技术、经济综合效益最优化为研究目标。培养的国 际留学研究生应能比较熟练的阅读矿产普查与勘探专业中、外文资料，并具有学术交流能 力。了解矿产普查与勘探学科的发展趋势和研究前沿，能够运用地学（地质、地球化学、 地球物理、遥感）理论、方法、和现代化高科技手段，开展地球内部结构构造、地球动力 和演化、资源勘查与开发利用、环境与工程勘查、数字矿山等方面的科学研究、教学或管理工作。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。

二、Fields of Study 主要研究方向

Fields of Study 研究方向	Research Contents 研究内容
Mineral Resource Prospecting and Exploration 矿产普查与勘探	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. 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. Features and advantages: traditional geosciences are integrated with information technologies such as big data mining and intelligent decision. 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。
Geo-exploration and Information Technology 地球探测与信息技术	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. 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. 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. 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。
Remote Sensing of Resources and Environment 资源与环境遥感	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. 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). Features and advantages: remote sensing quantitative analysis, temporal-spatial series analysis, quantitative prediction and evaluation of comprehensive information. 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、数字化与定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。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for Master and Ph.D. student are interconnected, and in general each credit is equivalent to 16 class hours.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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

Category 课程类别	Course Number 课程编号	Course Title 课程名称	Hours 学时	Credits 学分	Semesters 开课学期	Lecture Department 开课单位	Remarks 备注
Public Courses 公共学位课	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	≥12credits 不少于 12 学分
	X21504003	General Conditions of China 中国概况	32	2		——	

Category 课程类别	Course Number 课程编号	Course Title 课程名称	Hours 学时	Credits 学分	Semesters 开课学期	Lecture Department 开课单位	Remarks 备注
	X21504004	HSK level 3 HSK 三级	16	1		——	
	X21504005	Scientific Ethics and Writing 科技道德与写作	16	1		——	
Compulsory Specialized 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	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
	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 1 of 2 Courses 地球科学与资源学院必修（二选一）	≥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	石油地质学前沿（Petroleum geology frontier）	32	2		School of Energy Resources, Choose 1 of 2 Courses 能源学院必修（二选一）	
	S21306001	非常规油气勘探与开发进展（Progress in uncoventional energy exploration and development）	48	3			
	X21310002	地球物理基础（Fundamentals of Geophysics）	32	2		Information Technology 地球探测与信息技术学院必选	
	X21302002	Geological hazard prediction and prevention	32	2		School of Engineering	

Category 课程类别	Course Number 课程编号	Course Title 课程名称	Hours 学时	Credits 学分	Semesters 开课学期	Lecture Department 开课单位	Remarks 备注
	X21302001	FIDIC Conditions of Contract for Construction	32	2		and Technology，Choose 1 of 2Courses 工程学院 (二选 一)	
	新申报	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 3 Courses, ≥2 credits 水资源与环境学院 3 选 1 或 2，学分≥2	
	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		
Optional Specialized Course 专业选修课	B21501001	High-temperature geochemistry and cosmochemistr 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	School of Earth Sciences and Resources ≥6 credits 地球科学与资源学院 不少于 6 学分
	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	
	X21302004	Smart infrastructure 智慧基础设施	32	2	Autumn 秋季	School of Engineering and Technology 工程技术学院	
	X21314001	Taijiquan(24-forms) 24 式简化太极拳	16	1		Department of P. E. 体育部	
		油藏工程计算方法 Computational Methods in Petroleum Engineering	16	1		School of Energy Resources, Choose 3 of 4 Coureses	School of Energy Resources ≥6 credits

Category 课程类别	Course Number 课程编号	Course Title 课程名称	Hours 学时	Credits 学分	Semesters 开课学期	Lecture Department 开课单位	Remarks 备注
	X21306004	现代统计学（Modern ore deposits)	32	2		能源学院 4 选三	能源学院不少于 6 学分
	X21306002	人工智能与油气工程（Artificial intelligence appplication in petroleum engineering）	32	2			
	X21306003	气藏工程（Gas reservoir engineering）	32	2			
	X21314001	Taijiquan(24-forms) 24 式简化太极拳	16	1		Department of P. E. 体育部	
	X21310001	电法勘探（Electrical Exploration）	32	2		地信学院 4 选 3	Information Technology ≥6 credits 地信学院不少于 6 学分
	X21310003	重磁勘探（Gravity and Magnetic Exploration）	32	2			
	X21310004	岩石物理（Rock Physics）	32	2			
	X21310005	地震勘探（Seismic Exploration）	32	2			
	X21314001	Taijiquan(24-forms) 24 式简化太极拳	16	1		Department of P. E. 体育部	
	X21302004	Smart infrastructure	32	2		School of Engineering and Technolog 工程学院	School of Engineering and Technology ≥6 credits 工程学院不少于 6 学分
	X21302003	Occupational safety and health	32	2			
		Geological Engineering Technology	32	2			
	X21314001	Taijiquan(24-forms) 24 式简化太极拳	16	1		Department of P. E. 体育部	

Category 课程类别	Course Number 课程编号	Course Title 课程名称	Hours 学时	Credits 学分	Semesters 开课学期	Lecture Department 开课单位	Remarks 备注
	新申报	Hydrogeochemical processes and PHREEQC modeling 水文地球化学过程与 PHREEQC 模拟	32	2	Autumn	Water Resources and Environment 水资源与环境学院	School of Water Resources and Environment ≥6 credits 水环学院前门课必选，不少于 6 学分
	X21305002	Uncertainty Analysis for Groundwater Flow Modeling 地下水模拟不确定性分析	16	1	Autumn	Water Resources and Environment 水资源与环境学院	
	B21301004	Global change and Geomicrobiology 全球变化与地球微生物学	16	1		School of Earth Science 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		School of Earth Science and Resources 地球科学与资源学院	
	B21301027	Formation and Evolution of a Habitable Earth 宜居地球的形成和演化	32	2		School of Earth Science and Resources 地球科学与资源学院	
	X21307007	Resource and Environmental Economics 资源环境经济	32	2		School of Economics and Management 经济管理学院	
	X21307008	Resource and Environmental Management 资源环境管理	32	2		School of Economics and Management 经济管理学院	

Category 课程类别	Course Number 课程编号	Course Title 课程名称	Hours 学时	Credits 学分	Semesters 开课学期	Lecture Department 开课单位	Remarks 备注
	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	
	X21314001	Taijiquan(24-forms) 24 式简化太极拳	16	1		Department of P. E. 体育部	
Additional Requirements 必修环节	Professional Practice 专业实践			2			
	Thesis Proposal 论文开题报告			——			
	Thesis Progress Report 论文中期报告			——			
	Academic Presentation 作学术报告			——			

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.Geochimica 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 Engeering
39.JOURNAL OF PETROLEUM TECHNOLOGY
40.Journal of Sedimentary geolgoy
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.沉积学报
60.成矿规律与成矿预测
61.大型超大型矿床成矿动力学背景、过程与定量与评价
62.地球科学
63.地球物理勘探概论
64.地球物理学报
65.地球物理学进展
66.地球学报
67.地下工程与隧道
68.地学前缘
69.地质力学学报
70.地质论评

71.地质学报
72.定量地学方法及应用
73.非传统矿产资源概论
74.非开挖技术
75.高等土力学
76.工程地质学报
77.工程地质学报
78.古地理学报
79.金刚石钻探手册
80.勘查地球化学
81.勘查区找矿预测理论与方法
82.科学通报
83.矿产勘查理论与方法
84.矿产资源定量评价——一种综合方法
85.矿床地质
86.矿床统计预测
87.煤炭科学技术
88.煤炭学报
89.石油勘探与开发
90.石油学报
91.石油与天然气地质
92.世界找矿模型与矿产勘查
93.数学建模方法及其应用
94.水文地质与工程地质
95.探矿工程（岩土钻掘工程）
96.天然气工业
97.物探与化探
98.新疆石油地质
99.岩石力学与工程学报
100.岩石学报
101.岩土工程学报
102.岩土力学
103.岩性油气藏
104.遥感学报
105.隐伏矿床（体）找矿前景快速评价的有效方法与途径研究
106.中国地质
107.中国金属成矿系列的形成机制和结构特征
108.中国科学
109.中国矿产资源评价新技术与评价新模型
110.中国矿业大学学报
111.中国石油大学学报
112.综合信息矿产预测理论与方法
113.“111”引智计划（刘家军等）矿床勘查模型（名师讲堂系列教材与资料参考）2009-2017。
114.隐伏矿床（体）找矿前景快速评价的有效方法与途径研究

115.中国金属成矿系列的形成机制和结构特征
116.成矿规律与成矿预测
117.综合信息矿产预测理论与方法
118.中国矿产资源评价新技术与评价新模型
119.勘查地球化学
120.数学建模方法及其应用
121.矿产资源定量评价——一种综合方法
122.勘查区找矿预测理论与方法
123.地球物理勘探概论

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

(0820) 石油与天然气工程 硕士留学生 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 are required. The international students are also encouraged to handle the fundamental theory and professional knowledge of oil and gas engineering, have the ability of conducting research in oil/gas field development geology, theory and technology of oil/gas drilling and production, and theory and method of oil/gas development, etc, be equipped with the ability of innovation and the version of international, and have the ability of conducting research, teaching, managing, doing high-tech work. 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和敬业精神。掌握石油与天然气工程学科的基础理论和系统的专业知识，具有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。具备创新意识、国际化视野和从事科学研究、教学、管理、技术等工作能力。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。

二、Research Directions 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。
2. Theory and technology of oil/gas drilling and production 油气钻采理论与技术	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

3. Theory and method of oil/gas development 油气开发理论与方法	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。
4. Oilfield chemistry and EOR technology 油田化学与提高采收率技术	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。
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	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。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. Curriculum settings include Public Courses, Compulsory Courses, Optional Courses and other Compulsory Parts. The curriculums for Master and Ph.D. student are interconnected, and in general each credit is equivalent to 16 class hours.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	

公共 学位课	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	32	2			
	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
Optional Course 专业 选修课	X21306002	Artificial intelligence application in petroleum engineering 人工智能与油气工程	32	2			≥6 credits 不少于 6 学分
	X21306003	Oil and gas reservoir engineering 油气藏工程	32	2			
	S21306001	Progress in unconventional energy exploration and development 非常规油气勘探与开发进展	48	3			
	X21306005	Computational Methods in Petroleum Engineering 油藏工程计算方法	16	1			
	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	——	

	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：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 modeming, 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 Master Student

(0830) 环境科学与工程 硕士留学生 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, intellect, Physique and the United States, cultivating people with lofty ideological quality, friendly political stand to China, and possessing good international communication ability and environmental management and leadership ability, to master the basic development trends of environmental science and Engineering Technology Development, meet the needs of the international job market, abide by academic ethics and norms, rigorous academic attitude, realistic and innovative spirit, and higher professional quality, senior international professionals qualified for teaching, research, production, promotion and technology management in institutions of higher learning, research institutes, government agencies, enterprises 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，具备良好的国际交流能力和环境管理与领导能力，掌握环境科学与工程技术发展的基本发展动态，符合国际就业市场需求，遵守学术道德和规范，严谨的治学态度，求实的创新精神，较高的专业素质，能够胜任高等院校、科研院所、政府机关、企业和有关领域的教学、科研、生产、推广以及技术管理工作的高级国际化专业人才。

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	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. 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。
2. Environmental Engineering 环境工程	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. 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。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	
	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	32	2			
	X21305001	Remediation of Groundwater Pollution 地下水污染修复	16	1	Autumn	School of Water Resources and Environment 水资源与环境学院	≥2 credits 不少于 2 学分
	X21305002	Uncertainty Analysis for Groundwater Flow Modeling 地下水模拟不确定性分析	16	1	Autumn	School of Water Resources and Environment 水资源与环境学院	

Optional Course 专业选修课	B21301004	Global change and Geomicrobiology 全球变化与地球微生物学	16	1		School of Earth Science and Resources 地球科学与资源学院	≥6 credits 不少于 6 学分
	X21305003	Hydrogeochemical processes and PHREEQC modeling 水文地球化学过程与 PHREEQC 模拟	32	2		School of Water Resources and Environment 水资源与环境学院	
	X21305004	Hydrological Processes and Modeling 水文过程与模拟	32	2		School of Water Resources and Environment 水资源与环境学院	
	X21305005	Numerical Methods in Geotechnics 岩土工程数值模拟方法	16	1		School of Water Resources and Environment 水资源与环境学院	
	X21307007	Resource and Environmental Economics 资源环境经济	32	2		School of Economics and Management 经济管理学院	
	X21307008	Resource and Environmental Management 资源环境管理	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	——	
	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：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 Master Student

(1201) 管理科学与工程 硕士留学生培养方案

一、Training Goal 培养目标

To cultivate students who master the professional qualities with system science, management science and information technology. The ability, such as independent analysis and solving problems in modern enterprises and engineering projects, should be possessed. High-quality innovative and comprehensive management talents with all-round development of morality, intelligence and physique should be cultivated. The basic requirements include: (1) Excellent ideological and moral quality, strong dedication and professionalism, adapt to the requirements of economic construction and social development, and serve social development actively. (2) Understanding the latest research findings and development trends of management science and engineering. Being able to master the basic theories and systematic professional knowledge. Having the ability of carrying out related scientific research independently and cooperatively and a certain ability of innovation. (3) Understanding enterprise operation and management and relevant decision-making methods. Being able to engage in business management, analysis and evaluation and other auxiliary decision-making in enterprises and related organizations. (4) Having basic Chinese skills, being able to read and translate Chinese professional literature. Mastering strong computer application skills.

培养掌握和运用系统科学、管理科学、信息技术，独立分析和解决现代企业和工程项目等方面的问题，德、智、体全面发展的高层次创新型、综合型管理人才。具体要求是：（1）思想品质和道德素质优良、具有强烈的事业心和敬业精神，适应经济建设、社会发展的要求，积极为社会发展服务；（2）了解管理科学与工程学科的最新研究成果和发展趋势，掌握坚实宽广的基础理论和系统深入的专业知识，具有一定的独立和合作开展科学研究相关工作的能力和一定的创新的能力；（3）了解企业经营管理及相关决策方法，具备在企业及相关组织从事经营管理、分析评价等辅助决策能力；（4）掌握汉语，能较为熟练地阅读和翻译汉语专业资料，具有较强的计算机应用能力。

二、Training Directions 研究方向

Training Direction 研究方向	Research Content 研究内容
1. System Simulation	Guided by the theory of system science, this direction analyzes the

and Optimization Decision 系统模拟与优化决策	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. 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。
2. Resource Management Engineering 资源管理工程	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. 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。
3. Management Psychology and Behavioral Science 管理心理与行为	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. 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。
4. Risk and Emergency Managemen 风险与应急管理	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 and organization of the system, to control and reduce the risk and offer decision madding for the risk. 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。
5. Data Science and Business Intelligence 数据科学与商务智能	Based on the basic theories and algorithms of data mining, pattern discovery, business data analysis and prediction, collect, manage, and analyze structured and unstructured data and information through modern information technologies such as knowledge discovery and artificial intelligence. Support the formulation and optimization of business decisions by constructing data warehouse, management information system and decision support system. Solve the management and application problems of data analysis, data mining and artificial intelligence technology in business and industry (including mineral resources enterprises). 该方向主要以数据挖掘、模式发现、商业数据分析与预测的基本理论和算法为基础，通过知识发现、人工智能等现代信息技术收集、管理和分析结构化和非结构化的数据和信息，构建数据仓库、管理信息系统、决策支持系统等，以辅助商业决策的制定和优化，解决数据分析、数据挖掘和人工智能技术在商务和工业（含矿产资源企业）中的管理和应用问题。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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	X21504002	Chinese Language 汉语	128	8	Autumn, Spring	——	
	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	——	
	X21301001	Progress in Earth Science 地球科学进展	32	2	Autumn	School of Earth Sciences and Resources 地球科学与资源学院	
	X21307008	Resource and Environmental Management 资源环境管理	32	2	Autumn	School of economics and management 经济管理学院	≥2 credits 不少于 2 学分
Optional Course 专业选修课	X21307002	Crisis Management 危机管理	32	2	Spring	School of economics and management 经济管理学院	≥6 credits 不少于 6 学分
	X21307005	Mining Finance 矿业金融	16	1	Spring	School of economics and management 经济管理学院	

	X21307003	Frontiers of Management Theories 管理理论前沿	32	2	Autumn	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	Autumn	School of economics and management 经济管理学院	
	X21314001	Taijiquan(24-forms) 24 式简化太极拳	16	1	Autumn	Department of P. E. 体育部	
	Basic Practice of Chinese 汉语基础实践			1	Autumn	——	
	Chinese Professional application 汉语专业应用			2	Summer	——	
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：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

英文推荐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**	中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**
[1] Management Science [2] Academy of Management Journal [3] Academy of Management Review [4] American Economic Review [5] MIS Quarterly [6] Operations Research [7] Journal of Operations Management [8] Production and Operations Management	[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 管理世界 [4] Economic Research Journal 经济研究 [5] China Economic Quarterly 经济学（季刊） [6] Journal of Quantitative & Technical Economics

[9] European Journal of Operational Research [10] Journal of Finance [11] Journal of Management Information Systems [12] Academy of Management Annals [13] Econometrica [14] Annals of Statistics [15] Risk Analysis [16] Psychological Science [17] Annual Review of Psychology [18] Journal of Applied Psychology [19] Environmental and Resource Economics [20] Ecological Economics	数理经济技术经济研究 [7] China Soft Science 中国软科学 [8] Journal of Financial Research 金融研究 [9] Chinese Journal of Management Science 中国管理科学 [10] Journal of Systems Engineering 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

(1202) Business Administration Training Program for International Master Student

(1202) 工商管理 硕士留学生培养方案

一、Training Goal 培养目标

Through this training program, the students should have excellent academic ethics and humanistic quality, and a solid theoretical foundation of management. The students should master the basic methods of management theoretical research and applied research, should apply skillfully relevant technologies, methods, or tools to carry out theoretical academic research of business administration and solve practical problems of business administration and form unique academic opinions on the management of resource-based enterprises. The students will demonstrate certain knowledge in theoretical or practical innovation, literature reading, and language communication. In particular, they should be familiar with the special needs of the operation and management of mineral resource-based enterprises and be able to engage in management scientific research or management practice of industrial and commercial administration.

具有优良的学术道德和人文素养，具备扎实的管理学理论基础，掌握管理理论研究和应用研究基本方法，熟练应用相关技术、方法或工具开展工商管理的理论学术研究和解决工商管理现实问题，并对资源型企业管理形成独到的学术见解，展现一定的理论或实践创新能力，具有较强的文献阅读能力和语言交流能力。尤其是熟悉矿产资源型企业经营管理的特殊需求，具备从事工商管理的管理科学研究能力或管理实践工作能力。

二、Research Directions 研究方向

Research Direction 研究方向	Research Content 研究内容
1.Management and Evaluation of Resource based Enterprises 资源企业管理与评价	It mainly studies the development, utilization, and evaluation of mineral resources of resource-based enterprises, as well as relevant management issues in the development, evaluation, and market promotion of new energy projects, focusing on the operation and management of resource-based enterprises, international trade of mineral products, technical and economic evaluation of mining/energy projects, mining/energy project management, etc. 主要研究资源型企业的矿产资源开发、利用和评价等，以及新能源项目开发、评价和市场推广等过程中相关管理问题，重点涉及资源型企业经营管理、矿产品国际贸易、矿业/能源项目技术经济评价、矿业/能源项目管理等。

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

The length of study for postgraduate students in China is generally 3 years, and the maximum of study period is 4 years, and the credits should be no less than 31. 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.

来华留学硕士研究生学制 3 年，最长学习年限 4 年，不少于 31 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

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	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	32	2			
	X21307003	Frontiers of Management Theories 管理理论前沿	32	2	Autumn		≥2 credits 不少于 2 学分
Optional Course 专业选修课	X21307006	Research Methods of Data and Model 数据模型与方法	32	2	Autumn	School of economics and management 经济管理学院	≥6 credits 不少于 6 学分
	X21307001	Analysis of Business Operations 企业经营活动分析	32	2	Spring	School of economics and management 经济管理学院	

	X21307008	Resource and Environmental Management 资源环境管理	32	2		School of economics and management 经济管理学院	
	X21307007	Resource and Environmental Economics 资源环境经济	32	2		School of economics and management 经济管理学院	
	X21307002	Crisis Management 危机管理	32	2		School of economics and management 经济管理学院	
	X21307005	Mining Finance 矿业金融	16	1		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	——	
	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			——			

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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

教材和专著：

【1】Henry Mintzberg. The Strategy Process

【2】Phillp Kotler. Marketing Management
【3】Richard B. Chase,etc. Product and Operations Management
【4】丹尼尔 A.雷恩著.孙耀君译.管理思想的演变.北京：中国社会科学出版社
【5】斯蒂芬.P.鲁宾斯著. 李原，孙健敏，黄小勇译.管理学. 北京：中国人民大学出版社
【6】迈克尔.波特著. 陈小悦译.竞争战略. 北京：华 Summer 出版社
【7】迈克尔.波特著. 陈小悦译.竞争优势. 北京：华 Summer 出版社
【8】迈克尔.波特著. 李明轩，邱如美译.国家竞争优势. 北京：华 Summer 出版社
【9】弗雷德里克.温斯洛.泰罗.科学管理原理. 北京：机械工业出版社
【10】弗兰克.卡德斯等著. 金钰译. 消费者行为学. 北京：中国人民大学出版社
【11】威廉.爱德华兹.戴明等著.裴咏铭译. 戴明管理思想精要:质量管理之父的领导力.北京：西苑出版社
【12】邹仲海等编著. 企业风险管理. 北京：电子工业出版社
【13】傅家骥等编著. 工业技术经济学. 北京：清华大学出版社
【14】孔锐等编著.市场营销-大数据背景下的营销决策与管理.北京：清华大学出版社
【15】王永贵编著.客户关系管理. 北京：高等教育出版社
【16】韩福荣主编.现代质量管理学. 北京：机械工业出版社
【17】姜启源等编.数学模型.北京：高等教育出版社
【18】王可定，周献中主编.运筹决策理论方法新编. 北京：清华大学出版社
【19】赵丽芬，刘小元主编. 管理理论与实务. 北京：清华大学出版社

期刊：

【20】工业工程与管理
【21】管理世界
【22】管理学报
【23】管理科学学报
【24】管理评论
【25】环境科学学报
【26】经济研究
【27】经济研究经济学动态
【28】珞珈管理评论
【29】数量经济技术
【30】世界经济
【31】企业管理
【32】南开管理评论
【33】心理科学进展
【34】心理学报
【35】预测
【36】运筹与管理
【37】营销科学学报
【38】中国管理科学
【39】中国工业经济
【40】中国人力资源开发
【41】中国社会科学
【42】中国工业经济
【43】中国人口.资源与环境

【44】Academy of Management Journal
【45】Academy of Management Review
【46】Administrative Science Quarterly
【47】Annual Review of Organizational Psychology and Organizational Behavior
【48】American Economic Review
【49】Business Strategy and the Environment
【50】Contemporary Accounting Research
【51】Energy Economics
【52】Human Resource Management Journal
【53】Industrial Marketing Management
【54】Journal of Business Venturing
【55】Journal of Consumer Research
【56】Journal of International Business Studies
【57】Journal of Management
【58】Journal of Marketing
【59】Journal of Marketing Research
【60】Journal of Organizational Behavior
【61】Journal of Retailing and Consumer Services
【62】Management Science
【63】Organizational Behaviors and human decision processes
【64】Organizational research methods
【65】Resource Management
【66】Resources Policy