地球科学与资源学院

School of Earth Sciences and Resources

地质学专业（理科基地班）培养方案

一、专业培养目标

本专业面向地质学国际一流学科建设和国家经济社会发展对地质学专门人才的需求，围绕地质学创新和资源、能源和环境需要，培养德、智、体、美、劳全面发展，适应现代自然科学发展需要，掌握宽广和系统的地质学及相关学科基础理论和知识，了解地质学前沿问题和发展动态，具有国际视野、创新能力和协作精神的专门人才。经过 5 年的实际工作，能够独立承担和组织科学研究、教学工作、生产或胜任相关管理工作。

二、毕业要求

本专业学生应熟悉党和国家的各项方针和政策，具有强健体魄和健康身心，达到国家规定的大学生体育和军事训练合格标准，具有责任感和家国情怀，具有坚实的数、理、化基础和较好的科学素养与合作精神。通过系统学习学科基础课程和相关专业核心课程，掌握地质学基础理论、基础知识和基本技能；通过系统的实践教学与创新创业培养，熟悉地质科学基础研究程序、实践实验方法，基本掌握支撑地质学主要学科研究和发展的试验设备系统，具备较好的科研和相关生产工作的能力；通过参与学术活动，掌握文献检索、资料查阅工作方法，了解地质学基础理论研究的前沿问题和发展动态与趋势，具备解决问题的能力与创新精神。

三、主干学科

地质学。

四、学制与学位

学制四年。学生修满规定的最低毕业学分，达到毕业要求后，授予理学学士学位。

五、核心课程

专业核心课程：遥感地质学、地球化学、第四纪地质学与地貌学、沉积学与古地理学、区域大地构造学基础、区域地质调查学、地质微生物学、矿床学基础、地球物理学。

实践课程：实验物理、实验化学、北戴河地质认识实习、周口店地质教学实习、燕山基地综合地质训练、科研实践、毕业论文。

Undergraduate Program in Geology
(Science-Based Class)

1. Academic Objectives

Majoring in geology (Science-Based Class) trains geological talents for the top disciplines and the national economic and social development, and meets the requirements of geological innovation, resource, energy, and environment. Students have a broad foundation for the development of modern natural science with comprehensive development in morals, intelligence, sports, aesthetics, and labor. Students systematically master the basic theory, knowledge and skill of geology and related subjects. They are specialists who understand frontier issues and development trends of geology and have international vision, innovative ability and cooperative essence. After 5 years of practical work, they could independently undertake and organize scientific research, teaching, production, or competent for related administration.

2. Graduation Requirements

Graduated students should be familiar with the principles and policies of the Communist Party and Nation, have a healthy physical and mental states, and meet the national standards for college students' physical education and military training with a sense of responsibility and an emotion of “family-country”. They will have a solid foundation in mathematics, physics and chemistry with good scientific literacy and a spirit of cooperation. Students should master basic knowledge of geology, theory and skills based on systemic learning of the curriculum, including fundamental disciplinary courses and specialized core courses. They will be familiar with the basic research program of geological science, practice and experimental methods, and know the experimental facilities that back up the research and development of geology with the preliminary ability for scientific research and related production work after systemically training with practice education and cultivation of innovation and entrepreneurship. Students should be able to conduct bibliographic retrieval and access information, and well understand the recent status, frontier issues, major problems and developing trends in main research fields of geology, and have the ability to solve problems with innovation.

3. Main Disciplines

Geology.

4. Length of Schooling and Degree

The length of schooling is four years of full-time study. Students will be awarded the Bachelor Degree of Science when they have completed the required minimum credits and have met all other requirements.

5. Core Courses

Specialized Core Curses: Remote Sensing Geology, Geochemistry, Quaternary Geology and Geomorphology, Sedimentology and Palaeogeography, Regional Geology and Tectonics, Regional Geological Survey, Geomicrobiology, Introduction to Ore Geology, Geophysics.

Practice Courses: Physics Experiments, Chemistry Experiments, Geological Survey Field Trip in Beidaihe, Geological Survey Field Trip in Zhoukoudian, Advanced Geological Field Training in Yanshan Region, Research Practice, Graduation Thesis.

六、最低毕业总学分要求及学分分配 (Minimum Required Credits and Distribution)

课程模块 Course module	课程类别 Course Classification	学时数 Hours	学分 Credits	学 期 Semester										
				1	2	1 夏	3	4	2 夏	5	6	3 夏	7	8
通识教育 Liberal Education	通识教育必修课程 Required Courses of General Education	730	40	11.25	13.25	1	4.25	5.25		3. 25	1.25		0. 25	0.25
	通识教育选修课程 Selective Courses of General Education	192	12											
专业教育 Professional Education	学科基础课程 Disciplinary Fundamental Courses	1024	64	10	13		16.5	22.5		2				
	专业核心课程 Specialized Fundamental Courses	416	26							20	3		3	
	专业拓展课程 Specialized Development	176	11		1		2	2		2	1		1	
实践教育 Practical Education	课程实践 Course Practice	30 周 +128 学时	30		5	4	1		6			8		6
	课外实践 Extracurricular practice		6											
必修课总学分 Required course credits				160										
选修课总学分 Elective course credits				29										
最低毕业总学分 Total Credits				189										

七、课程设置 (Curriculum)

1、**通识教育必修课程** (Required Courses of General Education)：730 **学时** (730 Hours)，40 **学分** (40 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
GR181009	思想道德与法治 Ideological Morality and Rule of Law	48	3	40	8		考试 Exam	1	
GR181008	中国近现代史纲要 Essentials of Modern Chinese History	48	3	40	8		考试 Exam	2	
GR182014	马克思主义基本原理 Fundamental Principles of Marxism	48	3	40	8		考试 Exam	3	
GR183004	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thoughts and Theoretical System of the Chinese Characteristic Socialism	64	4	48	16		考试 Exam	4	
GR182022	习近平新时代中国特色社会主义思想概论 Introduction to Xi Jinping Thoughts on Socialism with Chinese Characteristics in the New Era	48	3	48			考试 Exam	5	
GR181013	形 势 与 政 策 (1) Situation and Policy(1)	4	0.25	4			考查 Term Paper	1	
GR181014	形 势 与 政 策 (2) Situation and Policy(2)	4	0.25	4			考查 Term Paper	2	
GR181015	形 势 与 政 策 (3) Situation and Policy(3)	4	0.25	4			考查 Term Paper	3	
GR181016	形 势 与 政 策 (4) Situation and Policy(4)	4	0.25	4			考查 Term Paper	4	
GR181017	形 势 与 政 策 (5) Situation and Policy(5)	4	0.25	4			考查 Term Paper	5	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
GR181018	形 势 与 政 策 (6) Situation and Policy(6)	4	0.25	4			考查 Term Paper	6	
GR181019	形 势 与 政 策 (7) Situation and Policy(7)	4	0.25	4			考查 Term Paper	7	
GR181020	形 势 与 政 策 (8) Situation and Policy(8)	4	0.25	4			考查 Term Paper	8	
GR301004	大学生职业生涯规划与就业指导（1） Career Planning and Employment Guidance for University Students (1)	20	1	16	4		考试 Exam	2	
GR303005	大学生职业生涯规划与就业指导（2） Career Planning and Employment Guidance for University Students (2)	18	1	12	6		考试 Exam	6	
GR301005	大学生心理素质教育（1） Mental Health (1)	16	1	16			考查 Term Paper	1	
GR303005	大学生心理素质教育（2） Mental Health (2)	16	1	16			考查 Term Paper	5	
GR302008	军事理论 Military Theory	36	1	36			考试 Exam	1	
GR081071	大学英语（1） College English(1)	64	4	64			考试 Exam	1	
GR081072	大学英语（2） College English(2)	32	2	32			考试 Exam	2	
GR081067	大学英语素质拓展课 Competence-oriented Education for College English	32	2	32				2	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
GR141005	体育（1）（系列课程） Physical Education (1)	32	1		32		考试 Exam	1	
GR141006	体育（2）（系列课程） Physical Education(2)	32	1		32		考试 Exam	2	
GR142007	体育（3）（系列课程） Physical Education(3)	32	1		32		考试 Exam	3	
GR142008	体育（4）（系列课程） Physical Education(4)	32	1		32		考试 Exam	4	
GR041001	大学计算机 College Computer	32	2	16	16		考试 Exam	1	
GR041003	程序设计基础 A Fundamentals of Programming A	64	4	24	24	16	考试 Exam	2	
总计 Total		730	40	492	222	16			

2、**通识教育选修** (Selective Courses of General Education)：192 **学时** (192Hours)，12 **学分** (12 Credits)

序号 No.	课程类别 Courses Classification	课程名称 Courses Name	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
1	人文社科类（含在线课程） Humanities and Social Sciences Courses (Inc. Online courses)	见附件 1	7	考查 Term Paper	2-8	4 个类别中选修 7 个学分，其中，《大学生安全教育》（1 学分）必选。
2	自然科学类（含在线课程） Natural Science Courses (Inc. Online Courses)	见附件 2		考查 Term Paper	2-8	
3	自然文化类 Natural Culture Courses	见附件 3		考查 Term Paper	2-8	
4	体育与健康类 Sports and Health Courses	见附件 4		考查 Term Paper	5-8	
5	创新创业教育类（含在线课程） Innovation and Entrepreneurship Courses (Inc. Online Courses)	见附件 5	3	考查 Term Paper	2-8	选修 3 个学分，其中《新生研讨课》（1 学分）必选。
6	审美与艺术类 Aesthetics and Art Courses	见附件 6	2	考查 Term Paper	2-4	
总计 Total			12			

3、学科基础课程 (Disciplinary Fundamental Courses)：1024 学时（1024 Hours)，64 学分 (64 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
DR010001	地质学专业导论 Introduction of Geology	16	1	16			考查 Term Paper	1	
DR191001	高等数学 A（1） Advanced Mathematics A (1)	96	6	96			考试 Exam	1	
DR191002	高等数学 A（2） Advanced Mathematics A (2)	96	6	96			考试 Exam	2	
DR192005	线性代数 Linear Algebra	32	2	32			考试 Exam	3	
DR192006	概率论与数理统计 Probability and Mathematics Statistic	48	3	48			考试 Exam	4	
DR191008	大学物理（1） College Physics (1)	48	3	48			考试 Exam	2	
DR192009	大学物理（2） College Physics (2)	48	3	48			考试 Exam	3	
DR191010	大学化学 College Chemistry	48	3	48			考试 Exam	1	
DR192017	物理化学 B Physical Chemistry B	48	3	48			考试 Exam	3	
DR193116	数学物理方法 Methods of Mathematical Physics	32	2	32			考试 Exam	5	
DR122001	测 量 学 A Surveying A	40	2.5	24	16		考试 Exam	4	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
DR011036	地球科学概论 Geosciences	64	4	32	32	8	考试 Exam	2	
DR012064	结晶学与矿物学 Crystallography and Mineralogy	104	6.5	52	52		考试 Exam	3	双语 Bilingual
DR012065	晶体光学 Crystal Optics	32	2	14	18		考试 Exam	3	
DR012069	岩浆岩岩石学 Magmatic Petrology	40	2.5	20	20		考试 Exam	4	
DR012068	变质岩岩石学 Metamorphic Petrology	40	2.5	20	20		考试 Exam	4	
DR012067	古生物学 Paleontology	32	2	16	16		考试 Exam	4	
DR012006	古生物学 Paleontology	48	3	24	24		考试 Exam	4	双语 Bilingual
DR012004	地史学 Historical Geology	48	3	24	24		考试 Exam	4	双语 Bilingual
DR012037	构造地质学 Structural Geology	64	4	32	32		考试 Exam	4	
总计 Total		1024	64	772	252				

4、**专业核心课程** (Specialized Core Courses)：416 **学时** (416 Hours)，26 **学分** (26 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013075	遥感地质学 Remote Sensing Geology	48	3	24	24		考试 Exam	5	
SR013011	地球化学 Geochemistry	48	3	40	8		考试 Exam	5	
SR013025	第四纪地质学与地貌学 Quaternary Geology and Geomorphology	48	3	24	24		考试 Exam	5	
SR013008	沉积学与古地理学 Sedimentology and Palaeogeography	48	3	24	24		考试 Exam	5	
SR013041	区域大地构造学基础 Regional Geology and Tectonics	48	3	24	24		考试 Exam	5	
SR013074	地质微生物学 Geomicrobiology	32	2	16	16		考试 Exam	5	
SR013042	区域地质调查学 Regional Geological Survey	48	3	24	24		考试 Exam	6	
SR013101	矿床学基础 Introduction to Ore Geology	48	3	32	16		考试 Exam	5	
SR103025	地球物理学 Geophysics	48	3	40	8		考试 Exam	7	
总计 Total		416	26	232	184				

5、**专业拓展课程** (Specialized Development Courses)：176 **学时** (176 Hours)，11 **学分** (11Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SS011102	Geosciences	16	1	16			考查 Term Paper	2	必选、外教授课
SS013103	科技论文写作	16	1	16			考查 Term Paper	6	必选
DR082060	英语听说、写作（1） Oral English & Writing(1)	32	2	32			考查 Term Paper	3	必选
DR082061	英语听说、写作（2） Oral English & Writing(2)	32	2	32			考查 Term Paper	4	必选
DR082062	英语听说、写作（3） Oral English & Writing(3)	32	2	32			考查 Term Paper	5	必选
SR014010	中国区域地质学 Regional Geology of China	32	2	16	16		考查 Term Paper	7	任选 2 学分 Optional
DR011001	大学生物学 College Biology	24	1.5	12	12		考试 Exam	2	
SS014104	深时大数据与地球演化 Deep Time Big Data and Earth Evolution	32	2	24	8		考试 Exam	7	
SS013105	矿石学与矿相学 A Ore Petrology and Microscopy A	32	2	12	20		考试 Exam	6	
SS012106	跨国跨地区实习 International and Trans Regional Field Practice	1 周	1		1 周		考查 Term Paper	2 夏	
	学科前沿课 Frontier Courses	16	1					7	任选 1 学分 Optional
总计 Total			11						

6、**课程实践** (Course Practice)：30 **周** +128 **学时** (30 weeks and 128 hours)，30 **学分** (30 Credits)

课程代码 Course Code	课程名称 Course Name	周数（学时） Week(hour)	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
PR311003	军事技能训练 Military Theory and Practice	2 周	1	考查 Term Paper	1	
PR181010	思想政治社会实践 Political Social Practice	32 学时	2	考查 Term Paper	1 夏	
PR191045	实验物理（1） Physics Experiments (1)	24 学时	1	考试 Exam	2	
PR192046	实验物理（2） Physics Experiments (2)	24 学时	1	考试 Exam	3	
PR191047	实验化学 Chemistry Experiments	48 学时	2	考试 Exam	2	
PR011044	北戴河地质认识实习 Geological Survey Field Trip in Beidaihe	2 周	2	考查 Term Paper	1 夏	
PR012045	周口店地质教学实习 Geological Survey Field Trip in Zhoukoudian	6 周	6	考查 Term Paper	2 夏	
PR013049	燕山基地综合地质训练 Advanced Geological Field Training in Yanshan Region	2 周	2	考查 Term Paper	3 夏	
PR013107	科研实践 Research Practice	6 周	6	考查 Term Paper	3 夏	
PR014043	毕业论文 Graduation Thesis	12 周	6	考查 Term Paper	8	
总计 Total		30 周 +128 学时	30			

7、**课外实践** (Extracurricular practice)：6 **学分** (6 Credits)

包括主题教育活动、社会实践、志愿服务、勤工助学、学科竞赛、文体活动、创新创业活动、劳动实践等，其学分的认定按照教务处相关规定执行。

Extracurricular practice include Theme Education, Social Practice, Volunteer Service, Work-study Program, Discipline Competition, Cultural and Sports Activities, Innovative and Entrepreneurial Activities, Labor Practice and so on. The recognition of the credits for extracurricular practice shall be implemented according to the regulations of Academic Affairs Office.

燕山书院（地质学拔尖学生培养计划 2.0）

一、专业培养目标

本专业面向地质学国际一流学科建设和国家经济社会发展对地质学专门人才的需求，围绕地质学创新和资源、能源和环境需要，培养德、智、体、美、劳全面发展，适应现代自然科学发展需要，掌握宽广和系统的地质学及相关学科基础理论和知识，了解地质学前沿问题和发展动态，具有国际视野、创新能力和协作精神的对地质学科有志向、有志愿、有志趣的人才。为培养未来能够引领世界地球科学某些领域发展的战略科学家储备人才。

二、毕业要求

本专业学生应熟悉党和国家的各项方针和政策，具有强健体魄和健康身心，达到国家规定的大学生体育和军事训练合格标准，具有责任感和家国情怀，具有坚实的数、理、化基础和较好的科学素养、人文素养与合作精神。通过系统学习学科基础课程和相关专业核心课程，掌握地质学基础理论、基础知识和基本技能；通过系统的实践教学与创新创业培养，熟悉地质科学基础研究程序、实践实验方法，基本掌握支撑地质学主要学科研究和发展的试验设备系统，具备较好的科研和相关生产工作的能力；通过参与学术活动，掌握外语交流、文献检索、资料查阅工作方法，了解地质学基础理论研究的前沿问题和发展动态与趋势，具备解决问题的能力与创新精神。

三、主干学科

地质学。

四、学制与学位

本科学制四年。学生修满规定的最低毕业学分，达到毕业要求后，授予理学学士学位。

实施“本－博”贯通培养模式，燕山书院学生完成本科规定学分后，可根据学习进展和导师意见，申请缩短本科修读年限，提前攻读博士学位。

五、核心课程

专业核心课程：由导师与学生共同确定，不少于 20 学分（含国内外名校短期学习选修的学分）。

实践课程：北戴河地质认识实习、周口店地质教学实习、燕山基地综合地质训练、跨国跨地区实习、科研实践、毕业论文。

Undergraduate Program in Yanshan College
(Top Student Training Plan in Geology-2.0 Base)

1. Academic Objectives

Majoring in geology trains geological talents for the top disciplines and the national economic and social development, and meets the requirements of geological innovation, resource, energy, and environment. Students have a broad foundation for the development of modern natural science with comprehensive development in morals, intelligence, sports, aesthetics, and labor. Students systematically master the basic theory, knowledge and skill of geology and related subjects. They are specialists who understand frontier issues and development trends of geology and have international vision, innovative ability and cooperative essence. They have ambition, willingness and interest in geology, and are expected to become strategic scientists and reserve talents who can lead the development of some fields of Earth Science in the world in the future.

2. Graduation Requirements

Graduated students should be familiar with the principles and policies of the Communist Party and Nation, have a healthy physical and mental states, and meet the national standards for college students' physical education and military training with a sense of responsibility and an emotion of “family-country”. They will have a solid foundation in mathematics, physics and chemistry with good scientific literacy and a spirit of cooperation. Students should master basic knowledge of geology, theory and skills based on systemic learning of the curriculum, including fundamental disciplinary courses and specialized core courses. They will be familiar with the basic research program of geological science, practice and experimental methods, and know the experimental facilities that back up the research and development of geology with the preliminary ability for scientific research and related production work after systemically training with practice education and cultivation of innovation and entrepreneurship. Students should be able to conduct bibliographic retrieval and access information, and well understand the recent status, frontier issues, major problems and developing trends in main research fields of geology, and have the ability to solve problems with innovation.

3. Main Disciplines

Geology.

4. Length of Schooling and Degree

The length of schooling is four years of full-time study. Students will be awarded the Bachelor Degree of Science when they have completed the required minimum credits and have met all other requirements.

"Undergraduate-Doctor Degree" through-type training mode and Flexible Educational System. After completing the required undergraduate credits, students of Yanshan College can apply to shorten the undergraduate study period and study for a doctorate in advance according to their learning progress and the opinions of their tutors.

5. Core Courses

Specialized Core Curses of Yanshan College are jointly determined by tutors and students. Not less than 20 credits (including the credits for short-term elective courses in famous colleges at home and abroad).

Practice Courses: Geological Survey Field Trip in Beidaihe, Geological Survey Field Trip in Zhoukoudian, Advanced Geological Field Training in Yanshan Region, Research Practice, Graduation Thesis.

六、最低毕业总学分要求及学分分配 (Minimum Required Credits and Distribution)

课程模块 Course module	课程类别 Course Classification	学时数 Hours	学分 Credits	学 期 Semester										
				1	2	1 夏	3	4	2 夏	5	6	3 夏	7	8
通识教育 Liberal Education	通识教育必修课程 Required Courses of General Education	666	36	11	9		4	5	1	3	1			2
	通识教育选修课程 Selective Courses of General Education	192	12											
专业教育 Professional Education	学科基础课程 Disciplinary Fundamental Courses	928	58	10	13		15	20						
	专业核心课程 Specialized Fundamental Courses	320	20											
	专业拓展课程 Specialized Development	96	6											
实践教育 Practical Education	课程实践 Course Practice	30 周 +128 学时	31		5	4	1		5			9		6
	课外实践 Extracurricular practice		6											
必修课总学分 Required course credits				144										
选修课总学分 Elective course credits				24										
最低毕业总学分 Total Credits				168										

七、课程设置 (Curriculum)

1、**通识教育必修课程** (Required Courses of General Education)：666 **学时** (666 Hours)，36 **学分** (36 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
GR181009	思想道德与法治 Ideological Morality and Rule of Law	48	3	40	8		考试 Exam	1	
GR181008	中国近现代史纲要 Essentials of Modern Chinese History	48	3	40	8		考试 Exam	2	
GR182014	马克思主义基本原理 Fundamental Principles of Marxism	48	3	40	8		考试 Exam	3	
GR183004	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thoughts and Theoretical System of the Chinese Characteristic Socialism	64	4	48	16		考试 Exam	4	
GR182022	习近平新时代中国特色社会主义思想概论 Introduction to Xi Jinping Thoughts on Socialism with Chinese Characteristics in the New Era	48	3	48			考试 Exam	5	
GR180005	形势与政策 Situation and Policies	32	2	32			考查 Term Paper	1-8	
GR301004	大学生职业生涯规划与就业指导（1） Career Planning and Employment Guidance for University Students (1)	20	1	16	4		考试 Exam	2	
GR303005	大学生职业生涯规划与就业指导（2） Career Planning and Employment Guidance for University Students (2)	18	1	12	6		考试 Exam	6	
GR301005	大学生心理素质教育（1） Mental Health (1)	16	1	16			考查 Term Paper	1	
GR303005	大学生心理素质教育（2） Mental Health (2)	16	1	16			考查 Term Paper	5	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
GR302008	军事理论 Military Theory	36	1	36			考试 Exam	1	
GR081071	大学英语（1） College English (1)	64	4	64			考试 Exam	1	
GR081072	大学英语（2） College English (2)	32	2	32			考试 Exam	2	
GR081067	大学英语素质拓展课 Competence-oriented Education for College English	32	2	32			考试 Exam	2	
GR141005	体育（1）（系列课程） Physical Education (1)	32	1		32		考试 Exam	1	
GR141006	体育（2）（系列课程） Physical Education(2)	32	1		32		考试 Exam	2	
GR142007	体育（3）（系列课程） Physical Education (3)	32	1		32		考试 Exam	3	
GR142008	体育（4）（系列课程） Physical Education (4)	32	1		32		考试 Exam	4	
GR041001	大学计算机 College Computer	32	2	16	16		考试 Exam	1	
总计 Total		666	36	468	198				

2、**通识教育选修** (Selective Courses of General Education)：192 **学时** (192Hours)，12 **学分** (12 Credits)

序号 No.	课程类别 Courses Classification	课程名称 Courses Name	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
1	人文社科类（含在线课程） Humanities and Social Sciences Courses (Inc. Online courses)	见附件 1	7	考查 Term Paper	2-8	4 个类别中选修 7 个学分，其中，《大学生安全教育》（1 学分）必选。
2	自然科学类（含在线课程） Natural Science Courses (Inc. Online Courses)	见附件 2		考查 Term Paper	2-8	
3	自然文化类 Natural Culture Courses	见附件 3		考查 Term Paper	2-8	
4	体育与健康类 Sports and Health Courses	见附件 4		考查 Term Paper	5-8	
5	创新创业教育类（含在线课程） Innovation and Entrepreneurship Courses (Inc. Online Courses)	见附件 5	3	考查 Term Paper	2-8	选修 3 个学分，其中《新生研讨课》（1 学分）必选。
6	审美与艺术类 Aesthetics and Art Courses	见附件 6	2	考查 Term Paper	2-4	
总计 Total			12			

3、**学科基础课程** (Disciplinary Fundamental Courses)：928 **学时** (928 Hours)，58 **学分** (58 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
IS010040	地质学类专业导论 Introduction to Geology Speciality	16	1	16			考查 Term Paper	1	
DR191001	高等数学 A（1） Advanced Mathematics A (1)	96	6	96			考试 Exam	1	
DR191002	高等数学 A（2） Advanced Mathematics A (2)	96	6	96			考试 Exam	2	
DR192005	线性代数 Linear Algebra	32	2	32			考试 Exam	3	
DR192006	概率论与数理统计 Probability and Mathematics Statistic	48	3	48			考试 Exam	4	
DR191008	大学物理（1） College Physics (1)	48	3	48			考试 Exam	2	
DR192009	大学物理（2） College Physics (2)	48	3	48			考试 Exam	3	
DR191010	大学化学 College Chemistry	48	3	48			考试 Exam	1	
DR192017	物理化学 B Physical Chemistry B	48	3	48			考试 Exam	3	
DR122001	测量学 A Surveying A	40	2.5	24	16		考试 Exam	4	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
DR011036	地球科学概论 Geosciences	64	4	32	32	8	考试 Exam	2	
DR012062	结晶学与矿物学 Crystallography and Mineralogy	80	5	40	40		考试 Exam	3	
DR012065	晶体光学 Crystal Optics	32	2	16	16		考试 Exam	3	
DR012005	古生物学 Paleontology	40	2.5	20	20		考试 Exam	4	
DR012003	地史学 Historical Geology	40	2.5	20	20		考试 Exam	4	
DR012070	岩石学 Petrology	88	5.5	44	44		考试 Exam	4	
DR012037	构造地质学 Structural Geology	64	4	32	32	16	考试 Exam	4	
总计 Total		928	58	708	220	24			

4、**专业核心课程** (Specialized Core Courses)：320 **学时** (320 Hours)，20 **学分** (20 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
	核心课（校内、校外、国外可选）								
总计 Total									

注：燕山书院的专业核心课程由导师和学生共同确定，不少于 20 学分。

5、**专业拓展课程** (Specialized Development Courses)：96 **学时** (96 Hours)，6 **学分** (6 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
DR014080	地学元典 Classics in Earth Sciences	48	3	48			考查 Term Paper	4	任选 2 学分 Optional
SS014104	深时大数据与地球演化 Deep Time Big Data and Earth Evolution	32	2	24	8		考试 Exam	7	
SR013074	地质微生物学 Geomicrobiology	32	2	16	16		考试 Exam	5	
SS013108	表生地球化学与生态地质学 Supergene geochemistry and Ecological geology	32	2	24	8		考查 Term Paper	6	
SR013075	遥感地质学 Remote Sensing Geology	48	3	24	24		考试 Exam	5	
SS013103	科技论文写作 Scientific paper writing	16	1	16			考查 Term Paper	6	
	学科前沿课 Frontier Courses	见附件	1					7	任选 1 学分 Optional
总计 Total			6						

6、**课程实践** (Course Practice)：31 **周** +128 **学时** (29 weeks and 128 hours)，30 **学分** (30 Credits)

课程代码 Course Code	课程名称 Course Name	周数（学时） Week(hour)	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
PR311003	军事技能训练 Military Theory and Practice	2 周	1	考查 Term Paper	1	
PR181010	思想政治社会实践 Political Social Practice	32 学时	2	考试 Exam	2	
PR191045	实验物理（1） Physics Experiments (1)	24 学时	1	考试 Exam	2	
PR192046	实验物理（2） Physics Experiments (2)	24 学时	1	考试 Exam	3	
PR191047	实验化学 Chemistry Experiments	48 学时	2	考试 Exam	2	
PR011044	北戴河地质认识实习 Geological Survey Field Trip in Beidaihe	2 周	2	考查 Term Paper	1 夏	
PR012045	周口店地质教学实习 Geological Survey Field Trip in Zhoukoudian	6 周	6	考查 Term Paper	2 夏	
PR013049	燕山基地综合地质训练 Advanced Geological Field Training in Yanshan Region	2 周	2	考查 Term Paper	3 夏	
SS012106	跨国跨地区实习 International and Trans Regional Field Practice	1 周	1	考查 Term Paper	3 夏	
PR013110	科研实践 Research Practice	6 周	6	考查 Term Paper	3 夏	
PR014100	毕业论文 Graduation Thesis	12 周	6	考查 Term Paper	8	
总计 Total		128+30	30			

7、**课外实践** (Extracurricular practice)：6 **学分** (6 Credits)

包括主题教育活动、社会实践、志愿服务、勤工助学、学科竞赛、文体活动、创新创业活动、劳动实践等，其学分的认定按照教务处相关规定执行。

Extracurricular practice include Theme Education, Social Practice, Volunteer Service, Work-study Program, Discipline Competition, Cultural and Sports Activities, Innovative and Entrepreneurial Activities, Labor Practice and so on. The recognition of the credits for extracurricular practice shall be implemented according to the regulations of Academic Affairs Office.

（大类招生）地质学类本科专业培养方案

地质类是我校优势学科专业，本专业培养具备扎实的数学、物理学、化学、地球科学基础理论知识、计算机和地质数据处理；掌握地质学的野外工作技能、物质成分分析测试技术及基本的地球科学实验和鉴定技术，具备从事地质学基础理论研究、应用研究、分析实验、数据处理等工作的基本能力，为从事科学研究和管理工作以及继续深造奠定基础。通过四年的学习，学生能够掌握地质学的基本知识和基本理论，具有较强的实践动手能力，能够在地矿、冶金、建材、石油、煤炭、材料、环境、地质工程、旅游等领域从事基础地质的研究、应用及管理工作。具体包括（1）地质学；（2）地质－地球物理复合；（3）旅游地学；（4）地球化学；（5）资源勘查工程（固体矿产）；（6）地球信息科学与技术（大数据与数字地球方向）专业（方向）。培养计划中的课程体系分别按照 1-2 学年学科基础课程和 3-4 学年专业核心课程学习 2 个阶段制定。

第 1-2 学年的课程设置（通识教育课、学科基础课、课程实践及课外实践）见后表；第 3-4 学年的课程设置（专业核心课、专业拓展课、课程实践及课外实践）见各专业培养方案。

Undergraduate Program in Geology (Without Major Classification)

Geology is the dominant discipline of our university, this major cultivates solid mathematical, physical, chemical, earth science basic theoretical knowledge, computer and geological data processing; Master the field work skills of geology, the analysis and testing technology of material composition and the basic earth science experiment and identification technology, and have the basic ability to engage in basic theoretical research, applied research, analysis experiment, data processing and other work in geology, laying the foundation for engaging in scientific research and management work and continuing further education. Through four years of study, students can master the basic knowledge and basic theories of geology, have strong practical ability, and be able to engage in research, application and management of basic geology in the fields of geology and minerals, metallurgy, building materials, petroleum, coal, materials, environment, geological engineering, tourism and other fields. Specifically, it includes (1) geology; (2) Geo-geophysical composite; (3) Tourism geography; (4) geochemistry; (5) Resource exploration engineering (solid minerals); (6) Earth Information Science and Technology (Big Data and Digital Earth) Major (Direction). The curriculum system in the training plan is formulated according to the two stages of the 1-2 academic year subject basic course and the 3-4 academic year professional core course learning.

The curriculum of the 1-2 academic year (general education course, subject foundation course, curriculum practice and extracurricular practice) is shown in the table below; The curriculum of the 3rd and 4th academic years (professional core courses, professional development courses, curriculum practice and extracurricular practice) can be found in the training programs of each major.

大类课程 (Courses of General Major)

1、**通识教育必修课程** (Required Courses of General Education)：666 **学时** (666 Hours)，36 **学分** (36 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
GR181009	思想道德与法治 Ideological Morality and Rule of Law	48	3	40	8		考试 Exam	1	
GR181008	中国近现代史纲要 Essentials of Modern Chinese History	48	3	40	8		考试 Exam	2	
GR182014	马克思主义基本原理 Fundamental Principles of Marxism	48	3	40	8		考试 Exam	3	
GR183004	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thoughts and Theoretical System of the Chinese Characteristic Socialism	64	4	48	16		考试 Exam	4	
GR182022	习近平新时代中国特色社会主义思想概论 Introduction to Xi Jinping Thoughts on Socialism with Chinese Characteristics in the New Era	48	3	48			考试 Exam	5	
GR181013	形 势 与 政 策 (1) Situation and Policy(1)	4	0.25	4			考查 Term Paper	1	
GR181014	形 势 与 政 策 (2) Situation and Policy(2)	4	0.25	4			考查 Term Paper	2	
GR181015	形 势 与 政 策 (3) Situation and Policy(3)	4	0.25	4			考查 Term Paper	3	
GR181016	形 势 与 政 策 (4) Situation and Policy(4)	4	0.25	4			考查 Term Paper	4	
GR181017	形 势 与 政 策 (5) Situation and Policy(5)	4	0.25	4			考查 Term Paper	5	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
GR181018	形 势 与 政 策 (6) Situation and Policy(6)	4	0.25	4			考查 Term Paper	6	
GR181019	形 势 与 政 策 (7) Situation and Policy(7)	4	0.25	4			考查 Term Paper	7	
GR181020	形 势 与 政 策 (8) Situation and Policy(8)	4	0.25	4			考查 Term Paper	8	
GR301004	大学生职业生涯规划与就业指导（1） Career Planning and Employment Guidance for University Students (1)	20	1	16	4		考试 Exam	2	
GR303005	大学生职业生涯规划与就业指导（2） Career Planning and Employment Guidance for University Students (2)	18	1	12	6		考试 Exam	6	
GR301005	大学生心理素质教育（1） Mental Health (1)	16	1	16			考查 Term Paper	1	
GR303006	大学生心理素质教育（2） Mental Health (2)	16	1	16			考查 Term Paper	5	
GR302008	军事理论 Military Theory	36	1	36			考试 Exam	1 秋	
GR081071	大学英语（1） College English(1)	64	4	64			考试 Exam	1	
GR081072	大学英语（2） College English(2)	32	2	32			考试 Exam	2	
GR081067	大学英语素质拓展课 Competence-oriented Education for College English	32	2	32			考试 Exam	2	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
GR141005	体育（1）（系列课程） Physical Education (1)	32	1		32		考试 Exam	1	
GR141006	体育（2）（系列课程） Physical Education(2)	32	1		32		考试 Exam	2	
GR142007	体育（3）（系列课程） Physical Education(3)	32	1		32		考试 Exam	3	
GR142008	体育（4）（系列课程） Physical Education(4)	32	1		32		考试 Exam	4	
GR041001	大学计算机 College Computer	32	2	16	16		考试 Exam	1	
总计 Total		730	40	492	222	16			

2、**通识教育选修** (Selective Courses of General Education)：192 **学时** (192Hours)，12 **学分** (12 Credits)

序号 No.	课程类别 Courses Classification	课程名称 Courses Name	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
1	人文社科类（含在线课程） Humanities and Social Sciences Courses (Inc. Online courses)	见附件 1	7	考查 Term Paper	2-8	4 个类别中选修 7 个学分，其中，《大学生安全教育》（1 学分）必选。
2	自然科学类（含在线课程） Natural Science Courses (Inc. Online Courses)	见附件 2		考查 Term Paper	2-8	
3	自然文化类 Natural Culture Courses	见附件 3		考查 Term Paper	2-8	
4	体育与健康类 Sports and Health Courses	见附件 4		考查 Term Paper	5-8	
5	创新创业教育类（含在线课程） Innovation and Entrepreneurship Courses (Inc. Online Courses)	见附件 5	3	考查 Term Paper	2-8	选修 3 个学分，其中《新生研讨课》（1 学分）必选。
6	审美与艺术类 Aesthetics and Art Courses	见附件 6	2	考查 Term Paper	2-4	
总计 Total			12			

3、**学科基础课程** (Disciplinary Fundamental Courses)：928 **学时** (928 Hours)，58 **学分** (58 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
IS010040	地质学类专业导论 Introduction to Geology Speciality	16	1	16			考查 Term Paper	1	
DR191001	高等数学 A（1） Advanced Mathematics A (1)	96	6	96			考试 Exam	1	
DR191002	高等数学 A（2） Advanced Mathematics A (2)	96	6	96			考试 Exam	2	
DR192005	线性代数 Linear Algebra	32	2	32			考试 Exam	3	
DR192006	概率论与数理统计 Probability and Mathematics Statistic	48	3	48			考试 Exam	4	
DR191008	大学物理（1） College Physics (1)	48	3	48			考试 Exam	2	
DR192009	大学物理（2） College Physics (2)	48	3	48			考试 Exam	3	
DR191010	大学化学 College Chemistry	48	3	48			考试 Exam	1	
DR192017	物理化学 B Physical Chemistry B	48	3	48			考试 Exam	3	
DR122001	测量学 A Surveying A	40	2.5	24	16		考试 Exam	4	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
DR011036	地球科学概论 Geosciences	64	4	32	32	8	考试 Exam	2	
DR012064	结晶学与矿物学 Crystallography and Mineralogy	80	5	40	40		考试 Exam	3	
DR012065	晶体光学 Crystal Optics	32	2	16	16		考试 Exam	3	
DR012006	古生物学 Paleontology	40	2.5	20	20		考试 Exam	4	
DR012004	地史学 Historical Geology	40	2.5	20	20		考试 Exam	4	
DR012070	岩石学 Petrology	88	5.5	44	44		考试 Exam	4	
DR012037	构造地质学 Structural Geology	64	4	32	32	16	考试 Exam	4	
总计 Total		928	58	708	220	24			

4、**课程实践** (Course Practice)：9 **周** +128 **学时** (9 weeks and 128 hours)，14 **学分** (14 Credits)

课程代码 Course Code	课程名称 Course Name	周数（学时） Week(hour)	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
PR311003	军事技能训练 Military Theory and Practice	2 周	1	考查 Term Paper	1	
PR181010	思想政治社会实践 Political Social Practice	32 学时	2	考查 Term Paper	1 夏	
PR191045	实验物理（1） Physics Experiments (1)	24 学时	1	考试 Exam	2	
PR192046	实验物理（2） Physics Experiments (2)	24 学时	1	考试 Exam	3	
PR191047	实验化学 Chemistry Experiments	48 学时	2	考试 Exam	2	
PR011044	北戴河地质认识实习 Geological Survey Field Trip in Beidaihe	2 周	2	考查 Term Paper	1 夏	
PR012046	周口店地质教学实习 Geological Survey Field Trip in Zhoukoudian	5 周	5	考查 Term Paper	2 夏	
总计 Total		9 周 +128 学时	14			

5、**课外实践** (Extracurricular practice)：6 **学分** (6 Credits)

包括主题教育活动、社会实践、志愿服务、勤工助学、学科竞赛、文体活动、创新创业活动、劳动实践等，其学分的认定按照教务处相关规定执行。

Extracurricular practice include Theme Education, Social Practice, Volunteer Service, Work-study Program, Discipline Competition, Cultural and Sports Activities, Innovative and Entrepreneurial Activities, Labor Practice and so on. The recognition of the credits for extracurricular practice shall be implemented according to the regulations of Academic Affairs Office.

地质学专业培养方案

一、专业培养目标

本专业面向国际地质学学科和国家经济社会发展对地质学人才的需求，培养德、智、体、美、劳全面发展，掌握地质学基本理论、基础知识、基本技能，了解学科发展前沿和动态，能够运用地质学基本理论解决和探索资源、能源、环境、工程等领域实际问题，具有创新能力和协作精神的研究型、应用型和复合型人才，毕业后可在科研、教学、生产部门从事科学研究和管理工作的高级人才。经过 5 年的实际工作，能够独立从事科学研究、生产或管理工作。

二、毕业要求

地质学专业学生应具有健康、开阔的价值观、道德观、责任感以及家国情怀、人文情怀和世界胸怀，拥有地质学系统知识架构、开阔的认知视野和良好的科学素养。通过系统学习学科基础课程和相关专业核心课程，掌握地质学基础理论、基础知识和基本技能。通过系统的实践教学与创新创业培养，熟悉地质科学基础研究程序、实践实验方法，通过参与学术活动，掌握文献检索、资料查阅工作方法，了解地质学主要学科研究和发展趋势，初步具备能够运用地质学理论知识和现代地质学技术方法探索前沿科学问题、解决能源资源需求的能力。

三、主干学科

地质学。

四、学制与学位

学制四年。学生修满规定的最低毕业学分，达到毕业要求后，授予理学学士学位。

五、核心课程

专业核心课程：遥感地质学、地球化学、第四纪地质学与地貌学、沉积学与古地理学、区域大地构造学、区域地质调查学、矿床学基础、地质学专业英语、地球物理学、中国区域地质学。

实践课程：实验物理、实验化学、北戴河地质认识实习、周口店地质教学实习、燕山基地综合地质训练、专业实习、毕业论文。

Undergraduate Program in Geology

1. Academic Objectives

The major of Geology aids to the needs of construction and development of the Earth System Science, focusing on the demands of geological specialist for modern economy and society development of our country. Emphasis on training and full development of cultivate moral, intellectual, physical, aesthetic and labor, the students should master the basic theories, basic knowledge and basic skills of geology, understand the frontier and dynamic development of the discipline, and be able to use the basic theory to explore and solve practical problems in resources, energy, environment, engineering and other fields. They should be the research-oriented, application-oriented and compound talents with innovative ability and cooperative spirit, and can engage in scientific research and management in scientific research, teaching and production departments. After five years of practical work, the graduates will be able to grow up as a senior engineering technical personnel or technical management personnel.

2. Graduation Requirements

Graduated students should meet the national requirements of physical education and military training standards for college students with fitness and health. They will have a solid foundation in mathematics, physics and chemistry with good scientific literacy and a spirit of cooperation. Students should master basic geology knowledge, theory and skills based on systematic learning of the curriculum, including disciplinary fundamental courses and specialized core courses. They will be familiar with the basic research programs of geological science, practice and experimental methods, and know the experimental facilities that back up research and development of geology with preliminary ability for scientific research and related production work after systemically training with practice education and cultivation of innovation and entrepreneurship. Students should be able to conduct bibliographic retrieval and access to information, and well understand the recent status, frontier issues, major problems and developing trends in main research fields of geology, and have the ability to solve problems with innovation.

3. Main Disciplines

Geology.

4. Length of Schooling and Degree

The length of schooling is four years of full-time study. Students will be awarded the Bachelor Degree of Science when they have completed the required minimum credits and have met all other requirements.

5. Core Courses

Specialized Core Curses: Remote Sensing Geology, Geochemistry, Quaternary Geology and Geomorphology, Sedimentology and Palaeogeography, Regional Geology and Tectonics, Regional Geological Survey, Geomicrobiology, Introduction to Ore Geology, Geophysics.

Practice Courses: Physics Experiments, Chemistry Experiments, Geological Survey Field Trip in Beidaihe, Geological Survey Field Trip in Zhoukoudian, Advanced Geological Field Training in Yanshan Region, Research Practice, Graduation Thesis.

六、最低毕业总学分要求及学分分配 (Minimum Required Credits and Distribution)

课程模块 Course module	课程类别 Course Classification	学时数 Hours	学分 Credits	学 期 Semester										
				1	2	1 夏	3	4	2 夏	5	6	3 夏	7	8
通识教育 Liberal Education	通识教育必修课程 Required Courses of General Education	666	36	11.25	9.25		4.25	5.25	1	3.25	1.25		0.25	0.25
	通识教育选修课程 Selective Courses of General Education	192	12											
专业教育 Professional Education	学科基础课程 Disciplinary Fundamental Courses	928	58	10	13		15	20						
	专业核心课程 Specialized Fundamental Courses	448	28							18	3		7	
	专业拓展课程 Specialized Development	80	5											
实践教育 Practical Education	课程实践 Course Practice	29 周 +128 学时	29		5	4	1		5			8		6
	课外实践 Extracurricular practice		6											
必修课总学分 Required course credits				151										
选修课总学分 Elective course credits				23										
最低毕业总学分 Total Credits				174										

七、分专业课程设置 (Curriculum)

1、专业核心课程 (Specialized Core Courses)：448 学时 (448 Hours)，28 学分 (28 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013075	遥感地质学 Remote Sensing Geology	48	3	24	24		考试 Exam	5	
SR013011	地球化学 Geochemistry	48	3	40	8		考试 Exam	5	
SR013025	第四纪地质学与地貌学 Quaternary Geology and Geomorphology	48	3	24	24		考试 Exam	5	
SR013008	沉积学与古地理学 Sedimentology and Palaeogeography	48	3	24	24		考试 Exam	5	
SR013040	区域大地构造学 Regional Geology and Tectonics	48	3	24	24		考试 Exam	5	
SR013042	区域地质调查学 Regional Geological Survey	48	3	24	24		考试 Exam	6	
SR013101	矿床学基础 Introduction to Ore Geology	48	3	32	16		考试 Exam	5	
SR014134	地质学类专业英语 Specialty English for Geology	32	2	32			考试 Exam	7	
SR103025	地球物理学 Geophysics	48	3	40	8		考试 Exam	7	
SR014010	中国区域地质学 Regional Geology of China	32	2	16	16		考查 Term Paper	7	
总计 Total		448	28	280	168				

2、**专业拓展课程** (Specialized Development Courses)：80 **学时** (80 Hours)，5 **学分** (5 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013074	地质微生物学 Geomicrobiology	32	2	16	16		考试 Exam	5	任选 4 学分 Optional
SS013105	矿石学与矿相学 A Ore Petrology and Microscopy A	32	2	12	20		考试 Exam	6	
SR013018	勘查地球化学 Exploration Geochemistry	32	2	24	8		考试 Exam	5	
SS014104	深时大数据与地球演化 Deep Time Big Data and Earth Evolution	32	2	24	8		考试 Exam	7	
	学科前沿课 Frontier Courses	16	1	16			考查 Term Paper	7	任选 1 学分 Optional
总计 Total		80	5						

3、**课程实践** (Course Practice)：29 **周** +128 **学时** (29 weeks and 128 hours)，28 **学分** (28 Credits)

课程代码 Course Code	课程名称 Course Name	周数（学时） Week(hour)	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
PR013049	燕山基地综合地质训练 Advanced Geological Field Training in Yanshan Region	2 周	2	考查 Term Paper	3 夏	
PR013048	专业实习 Geological Field Trip	6 周	6	考查 Term Paper	3 夏	
PR014043	毕业论文 Graduation Thesis	12 周	6	考查 Term Paper	8	
总计 Total		20 周 +128 学时	14			

4、**课外实践** (Extracurricular practice)：6 **学分** (6 Credits)

包括主题教育活动、社会实践、志愿服务、勤工助学、学科竞赛、文体活动、创新创业活动、劳动实践等，其学分的认定按照教务处相关规定执行。

Extracurricular practice include Theme Education, Social Practice, Volunteer Service, Work-study Program, Discipline Competition, Cultural and Sports Activities, Innovative and Entrepreneurial Activities, Labor Practice and so on. The recognition of the credits for extracurricular practice shall be implemented according to the regulations of Academic Affairs Office.

地质学专业（地质 - 地球物理复合）培养方案

一、专业培养目标

本专业面向地球系统科学建设与发展需求，围绕我国经济和社会发展对地质类人才需要，培养德、智、体、美、劳全面发展，掌握地质学基本理论，具备应用各种地球物理方法解决地质问题的能力，具有综合运用地质、地球物理资料阐明物探异常的地质意义的专业素质。毕业后可在能源、矿业、冶金、地震、环境等领域从事技术开发与管理工作的综合应用型人才。经过 5 年的实际工作，能够胜任高级技术人才或项目管理人才的要求。

二、毕业要求

本专业毕业生应具有强健体魄和健康身心，达到国家规定的大学生体育和军事训练合格标准，有坚实的数、理、化基础和较好的科学素养与合作精神。通过系统学习学科基础课程和相关专业核心课程，掌握地质学和地球物理学基础理论、基础知识和基本技能。通过系统的实践教学与创新创业培养，熟悉地质 - 地球物理科学基础研究程序、实践实验方法，了解支撑地质学和地球物理学主要学科研究和发展的试验 ，具备初步的科研和相关生产工作的能力。通过参与学术活动，掌握文献检索、资料查阅工作方法，了解地质学基础理论研究和地球物理方法技术的前沿问题和发展动态与趋势，具备一定的解决问题的能力与创新精神。

三、主干学科

地质学。

四、学制与学位

学制四年。学生修满规定的最低毕业学分，达到毕业要求后，授予理学学士学位。

五、核心课程

专业核心课程：遥感地质学、地球物理学、区域大地构造学、重磁电原理与方法、地震与测井原理与方法、区域地质调查学、矿床学基础、地质学专业英语、地球物理数据处理。

实践课程：实验物理、实验化学、北戴河地质认识实习、周口店地质教学实习、燕山基地综合地质训练、专业实习、毕业论文。

Undergraduate Program in Geochemistry

1. Academic Objectives

The composite major of Geology and Geophysics aids to the needs of construction and development of the Earth System Science, focusing on the demands of geological specialist for modern economy and society development of our country. Emphasis on training and full development of cultivate moral, intellectual, physical, aesthetic and labor, the students should understand the basic theories of geology, having the ability to apply the geophysical methods in practice, as well as has the integrated use of geological, geophysical data elucidate the geological significance of the professional quality of geophysical anomalies. The graduates cannot only be engaged in teaching and research of related major, and technology development and technology management of certain production sectors, such as the field of energy, mining, metallurgy, earthquake, environment and so on, but also work as senior professional technical personnel in the administration department as a manager. After five years of practical work, the graduates will be able to grow up as a senior engineering technical personnel or technical management personnel.

2. Graduation Requirements

Graduated students should meet the national requirements of physical education and military training standard for college students with fitness and health. They will have a solid foundation in mathematics, physics and chemistry with good scientific literacy and a spirit of cooperation. Students should master the basic geology and geophysics knowledge, theory and skills based on systematic learning of curriculum, including disciplinary fundamental courses and specialized core courses. They will be familiar with the basic research program of geological science and geophysics, practical and experimental methods, and know the experimental facilities that back up research and development of geology and geophysics with preliminary ability for scientific research and related production work after systematic training with practical education and cultivation of innovation and entrepreneurship. Students should be able to conduct bibliographic retrieval and access to information, and well understand the recent status, frontier issues, major problems and developing trends in main research fields of geology and geophysics, and have abilities to solve problems with innovation.

3. Main Disciplines

Geology.

4. Length of Schooling and Degree

The length of schooling is four years of full-time study. Students will be awarded the Bachelor Degree of Science when they have completed the required minimum credits and have met all other requirements.

5. Core Courses

Specialized Core Courses: Remote Sensing Geology, Introduction to Geophysics, Regional Geology and Tectonics, Gravity and Magnetotellurics Methods, Seismology and Logging Methods, Regional Geological Survey, Introduction to Ore Geology, Specialty English for Geology, Geophysical Data Processing.

Practice Courses: Physics Experiments, Chemistry Experiments, Geological Survey Field Trip in Beidaihe, Geological Survey Field Trip in Zhoukoudian, Advanced Geological Field Training in Yanshan Region, Geological Field Trip, Graduation Thesis.

六、最低毕业总学分要求及学分分配 (Minimum Required Credits and Distribution)

课程模块 Course module	课程类别 Course Classification	学时数 Hours	学分 Credits	学 期 Semester										
				1	2	1 夏	3	4	2 夏	5	6	3 夏	7	8
通识教育 Liberal Education	通识教育必修课程 Required Courses of General Education	666	36	11.25	9.25		4.25	5.25	1	3.25	1.25		0.25	0.25
	通识教育选修课程 Selective Courses of General Education	192	12											
专业教育 Professional Education	学科基础课程 Disciplinary Fundamental Courses	928	58	10	13		15	20						
	专业核心课程 Specialized Fundamental Courses	416	26							18	3		5	
	专业拓展课程 Specialized Development	80	5											
实践教育 Practical Education	课程实践 Course Practice	29 周 +128 学时	29		5	4	1		5			8		6
	课外实践 Extracurricular practice		6											
必修课总学分 Required course credits				149										
选修课总学分 Elective course credits				23										
最低毕业总学分 Total Credits				172										

七、分专业课程设置 (Curriculum)

1、专业核心课程 (Specialized Core Courses)：416 学时 (416 Hours)，26 学分 (26 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013075	遥感地质学 Remote Sensing Geology	48	3	24	24		考试 Exam	5	
SR103025	地球物理学 Introduction to Geophysics	48	3	40	8		考试 Exam	5	
SR013040	区域大地构造学 Regional Geology and Tectonics	48	3	24	24		考试 Exam	5	
SR103047	重磁电原理与方法 Gravity and Magnetotellurics Methods	48	3	24	24		考试 Exam	5	
SR103048	地震与测井原理与方法 Seismology and Logging Methods	48	3	24	24		考试 Exam	5	
SR013042	区域地质调查学 Regional Geological Survey	48	3	24	24		考试 Exam	6	
SR013101	矿床学基础 Introduction to Ore Geology	48	3	32	16		考试 Exam	5	
SR014134	地质学类专业英语 Specialty English for Geology	32	2	32			考试 Exam	7	
SR104049	地球物理数据处理解译 Geophysical Data Processing and Interpretation	48	3	24	24		考试 Exam	7	
总计 Total		416	26	248	168				

2、**专业拓展课程** (Specialized Development Courses)：80 **学时** (80 Hours)，5 **学分** (5 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013074	地质微生物学 Geomicrobiology	32	2	16	16		考试 Exam	5	任选 4 学分 Optional
SS013105	矿石学与矿相学 A Ore Petrology and Microscopy A	32	2	12	20		考试 Exam	6	
SR013018	勘查地球化学 Exploration Geochemistry	32	2	24	8		考试 Exam	5	
SS013108	表生地球化学与生态地质学 Supergene geochemistry and Ecological geology	32	2	24	8		考查 Term Paper	6	
SS014104	深时大数据与地球演化 Deep Time Big Data and Earth Evolution	32	2	24	8		考试 Exam	7	
	学科前沿课 Frontier Courses	16	1	16			考查 Term Paper	7	任选 1 学分 Optional
总计 Total		80	5						

3、**课程实践** (Course Practice)：29 **周** +128 **学时** (29 weeks and 128 hours)，28 **学分** (28Credits)

课程代码 Course Code	课程名称 Course Name	周数（学时） Week(hour)	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
PR013049	燕山基地综合地质训练 Advanced Geological Field Training in Yanshan Region	2 周	2	考查 Term Paper	3 夏	
PR013048	专业实习 Geological Field Trip	6 周	6	考查 Term Paper	3 夏	
PR014043	毕业论文 Graduation Thesis	12 周	6	考查 Term Paper	8	
总计 Total		20周 +128 学时	14			

4、**课外实践** (Extracurricular practice)：6 **学分** (6 Credits)

包括主题教育活动、社会实践、志愿服务、勤工助学、学科竞赛、文体活动、创新创业活动、劳动实践等，其学分的认定按照教务处相关规定执行。

Extracurricular practice include Theme Education, Social Practice, Volunteer Service, Work-study Program, Discipline Competition, Cultural and Sports Activities, Innovative and Entrepreneurial Activities, Labor Practice and so on. The recognition of the credits for extracurricular practice shall be implemented according to the regulations of Academic Affairs Office.

地质学专业（旅游地学）培养方案

一、专业培养目标

本专业面向我国对旅游地学专业人才的需求，围绕国家公园及各类自然公园的需要，培养德、智、体、美、劳全面发展，适应全域旅游发展战略的需要，掌握地质学基础理论和旅游地学专业知识，具备地学旅游资源调查与利用、旅游规划能力，具有开拓创新精神和素质，毕业后可在自然资源部门及地学旅游领域，从事国家公园及自然公园设计、规划工作的专门人才。经过 5 年的实际工作，能够承担各类公园内地质遗迹资源的调查及规划工作或胜任地学旅游管理工作。

二、毕业要求

地质学专业（旅游地学）学生应热爱祖国、拥护中国共产党的领导，具有爱岗敬业、艰苦奋斗、求真务实、热爱劳动、遵纪守法、团结合作的品质；具有优良的思想品德、社会公德和职业道德，以及较强的心理调节和适应能力。具备厚实的地质学基础知识并建立良好的地质思维，掌握系统的旅游地学基础理论和基本技能；了解旅游地学研究的前沿和发展动态，熟悉旅游地学的工作程序、野外实践方法和资料收集、分析过程。通过参加本专业相关的学术和科研创新活动，培养学生科学创新精神。

三、主干学科

地质学。

四、学制与学位

学制四年。学生修满规定的最低毕业学分，达到毕业要求后，授予理学学士学位。

五、核心课程

专业核心课程：第四纪地质学与地貌学、遥感地质学、自然地理学、人文地理学、生态环境学、旅游学、旅游地学导论、国家公园与自然公园概论、旅游规划、地理信息系统、专业英语。

实践性教学环节：实验物理、实验化学、北戴河地质认识实习、周口店地质教学实习、旅游地学综合实习、专业实习、毕业论文。

Undergraduate Program in Geology
(Tourism Earth Science)

1. Academic Objectives

This major is oriented to the demand for Tourism Geoscience professionals in China, focusing on the needs from National Parks and Natural Parks, cultivating the professionals who have comprehensive development of morality, intelligence, physical fitness, aesthetic, and labor education. They will adapt to All-for-one Tourism development strategies, master basic theories of Geology and knowledge of Tourism Geoscience, and have the ability of investigation and utilization of Geoscience Tourism resources, Tourism Planning, and the spirit of pioneering and innovation. After graduation, they can be engaged in the design and planning works of National Parks and Natural Parks in the Natural resources department or Geoscience Tourism field. And, after five years of practical work, they can undertake the survey and planning of Geoheritage resources in various parks, or be competent in Geoscience Tourism management.

2. Graduation Requirements

The graduates should be devoted to the motherland, support the leadership of the Communist Party of China, with characters of love, dedication, hard work, plain living, truth seeking, labour loving, law abiding, unity and cooperation. They should have good thoughts, personable character, social morality and professional ethics, as well as the strong ability of psychological adjustment and adaptation. The students should have a solid foundation in natural science knowledge, and master basic theory, knowledge and skills of tourism earth science and related subjects, know well about the basic tourism earth science research processes, experimental methods, information collection and analytical skills, and understand frontier issues and developing trends of basic theory study. Students are trained with scientific innovative spirit through taking part in a number of scientific activities.

3. Main Disciplines

Geology.

4. Length of Schooling and Degree

The length of schooling is four years of full-time study. Students will be awarded the Bachelor Degree of Science when they have completed the required minimum credits and have met all other requirements.

5. Core Courses

Specialized Core Courses: Quaternary Geology and Geomorphology, Remote Sensing Geology, Physical Geography and Human Geography, Eco-environmental Science, Introduction to Tourism, Introduction to Tourism Earth Science, Introduction to National Parks and Geoparks, Regional Analysis and Planning, Geographic Information System, Computer Geoscience Cartography, Specialty English.

Practice courses: Physics Experiments, Chemistry Experiments, Geological Survey Field Trip in Beidaihe, Geological Survey Field Trip in Zhoukoudian, Practice of Explanation and Tour Guide for Geopark, Geological Field Trip, Graduation Thesis.

六、最低毕业总学分要求及学分分配 (Minimum Required Credits and Distribution)

课程模块 Course module	课程类别 Course Classification	学时数 Hours	学分 Credits	学 期 Semester										
				1	2	1 夏	3	4	2 夏	5	6	3 夏	7	8
通识教育 Liberal Education	通识教育必修课程 Required Courses of General Education	666	36	11.25	9.25		4.25	5.25	1	3.25	1.25		0.25	0.25
	通识教育选修课程 Selective Courses of General Education	192	12											
专业教育 Professional Education	学科基础课程 Disciplinary Fundamental Courses	928	58	10	13		15	20						
	专业核心课程 Specialized Fundamental Courses	416	26							18	3		5	
	专业拓展课程 Specialized Development	80	5											
实践教育 Practical Education	课程实践 Course Practice	29 周 +128 学时	29		5	4	1		5			8		6
	课外实践 Extracurricular practice		6											
必修课总学分 Required course credits				149										
选修课总学分 Elective course credits				23										
最低毕业总学分 Total Credits				172										

七、分专业课程设置 (Curriculum)

1、专业核心课程 (Specialized Core Courses)：416 学时 (416 Hours)，26 学分 (26 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013025	第四纪地质学与地貌学 Quaternary Geology and Geomorphology	48	3	24	24		考试 Exam	5	
SR013026	旅游地学导论 Introduction to Tourism Earth Science	32	2	16	16		考试 Exam	5	
SR013027	生态环境学 Eco-environmental Science	32	2	16	16		考试 Exam	5	
SR013109	自然地理学 Physical Geography	32	2	16	16		考试 Exam	5	
SR013110	人文地理学 Human Geography	32	2	16	16		考试 Exam	5	
SR013075	遥感地质学 Remote Sensing Geology	48	3	24	24		考试 Exam	6	
SR073140	旅游学 Introduction to Tourism	32	2	16	16		考试 Exam	6	
SR013029	国家公园与自然公园概论 Introduction to National Parks and Nature Parks	48	3	24	24		考试 Exam	6	
SR013111	旅游规划 Tourism Planning	32	2	16	16		考试 Exam	6	
SR013076	地理信息系统 Geographic Information System	48	3	20	28		考试 Exam	7	
SR014134	地质学类专业英语 Specialty English for Geology	32	2	32			考试 Exam	7	
总计 Total		416	26	220	196				

2、**专业拓展课程** (Specialized Development Courses)：80 **学时** (80 Hours)，5 **学分** (5 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013074	地质微生物学 Geomicrobiology	32	2	16	16		考试 Exam	5	任选 4 学分 Optional
SS013105	矿石学与矿相学 A Ore Petrology and Microscopy A	32	2	12	20		考查 Term Paper	6	
SR013018	勘查地球化学 Exploration Geochemistry	32	2	24	8		考试 Exam	5	
SS013108	表生地球化学与生态地质学 Supergene geochemistry and Ecological geology	32	2	24	8		考查 Term Paper	6	
SS014104	深时大数据与地球演化 Deep Time Big Data and Earth Evolution	32	2	24	8		考试 Exam	7	
	学科前沿课 Frontier Courses	16	1	16			考查 Term Paper	7	任选 1 学分 Optional
总计 Total		80	5						

3、**课程实践** (Course Practice)：29 **周** +128 **学时** (29 weeks and 128 hours)，28 **学分** (28Credits)

课程代码 Course Code	课程名称 Course Name	周数（学时） Week(hour)	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
PR013115	旅游地学综合实习 Comprehensive Practice of Tourism Earth Science	2 周	2	考查 Term Paper	3 夏	
PR013048	专业实习 Geological Field Trip	6 周	6	考查 Term Paper	3 夏	
PR014034	毕业论文 Graduation Thesis	12 周	6	考查 Term Paper	8	
总计 Total		20周 +128 学时	14			

4、**课外实践** (Extracurricular practice)：6 **学分** (6 Credits)

包括主题教育活动、社会实践、志愿服务、勤工助学、学科竞赛、文体活动、创新创业活动、劳动实践等，其学分的认定按照教务处相关规定执行。

Extracurricular practice include Theme Education, Social Practice, Volunteer Service, Work-study Program, Discipline Competition, Cultural and Sports Activities, Innovative and Entrepreneurial Activities, Labor Practice and so on. The recognition of the credits for extracurricular practice shall be implemented according to the regulations of Academic Affairs Office.

地球化学专业培养方案

一、专业培养目标

本专业面向二十一世纪社会对地球化学人才多方面的需要，培养德、智、体、美、劳全面发展，具有坚实基础理论和扎实掌握实用技能的地球化学专门人才。学生完成学业后，具有从事地球化学专业的理论和实际工作能力，并有较广的知识面，具备进一步学习深造的基础，既可从事理论研究，也能胜任应用领域的工作。经过 5 年的实际工作，毕业生可在大专院校、科研院所、国家机关以及国土、资源、环境、石油、海洋、农业、城建等部门从事科研、生产或管理工作。

二、毕业要求

地球化学专业毕业生应具有强健体魄和健康身心，达到国家规定的大学生体育和军事训练合格标准；掌握数学、物理、化学等相关学科的基本理论、知识和技能，具有厚实的专业基础知识；掌握基础地质和地球化学的基本理论、技能、工作方法和实验技能，具有对固体矿产地质和环境地质以及基础地球化学理论研究的基本能力；掌握文献检索、资料查阅的工作方法；了解支持地球化学学科发展的相关知识和实验方法，以及它们所针对的主要基础问题和应用问题。

三、主干学科

地质学。

四、学制与学位

学制四年。学生修满规定的最低毕业学分，达到毕业要求后，授予理学学士学位。

五、核心课程

专业核心课程：地球化学 A、有机地球化学、勘查地球化学、环境地球化学、地球化学多元统计分析、现代地球化学仪器分析、矿床学基础、专业英语、地球化学样品分析与数据应用统计。

实践课程：实验物理、实验化学、北戴河地质认识实习、周口店地质教学实习、地球化学综合实践、专业实习、毕业论文。

Undergraduate Program in Geochemistry

1. Academic Objectives

Geochemistry is a major aimed at cultivating special geochemistry talents, who are of morality, intelligence, physique, aesthetics and labor, the extensive needs of 21st century society for talents, and strong basic theoretical knowledge and practical skills. After a systematic education of geochemistry, students will have theoretical and practical work abilities engaging in geochemistry, comprehensive knowledge, and a foundation for further studies. They can not only engage in theoretical research, but also be qualified for applicative fields. After five years' practical work, the graduates can occupy positions in colleges and universities, institutions of scientific research, governmental offices, and production or management departments of land, resources, environment, petroleum, marine, agriculture and urban construction.

2. Graduation Requirements

Geochemistry graduates should meet the national requirements of physical education and military training standards for college students. Graduates should acquire several aspects of knowledge and abilities as follows: master basic theories, knowledge and skills of mathematics, physics and chemistry related with solid major fundamental knowledge; master basic theories, skills, operating methods and experimental skills of general geology and geochemistry; master basic theories, and basic abilities to study solid mineral geology, environmental geology and general geochemistry theories; master how to document retrieval and literature reviewing, know the test equipment system about studying and developing main subjects supporting geochemistry, and know the major fundamental issues and application problems about the equipment system.

3. Main Disciplines

Geology.

4. Length of Schooling and Degree

The length of schooling is four years of full-time study. Students will be awarded the Bachelor Degree of Science when they have completed the required minimum credits and have met all other requirements.

5. Core Courses

Specialized Core Courses Geochemistry A, Organic Geochemistry, Exploration Geochemistry, Environmental Geochemistry, Multivariate Statistics in Geochemistry, Modern Geochemical Instrument Analysis, Introduction to Ore Geology, Specialty English for Geochemistry, Sample analysis and applied statistics for geochemical data.

Practice Courses: Physics Experiments, Chemistry Experiments, Geological Survey Field Trip in Beidaihe, Geological Survey Field Trip in Zhoukoudian, Comprehensive Geochemical Practice, Geological Field Trip, Graduation Thesis.

六、最低毕业总学分要求及学分分配 (Minimum Required Credits and Distribution)

课程模块 Course module	课程类别 Course Classification	学时数 Hours	学分 Credits	学 期 Semester										
				1	2	1 夏	3	4	2 夏	5	6	3 夏	7	8
通识教育 Liberal Education	通识教育必修课程 Required Courses of General Education	666	36	11.25	9.25		4.25	5.25	1	3.25	1.25		0.25	0.25
	通识教育选修课程 Selective Courses of General Education	192	12											
专业教育 Professional Education	学科基础课程 Disciplinary Fundamental Courses	928	58	10	13		15	20						
	专业核心课程 Specialized Fundamental Courses	400	25							15	5		5	
	专业拓展课程 Specialized Development	80	5											
实践教育 Practical Education	课程实践 Course Practice	29 周 +128 学时	29		5	4	1		5			8		6
	课外实践 Extracurricular practice		6											
必修课总学分 Required course credits				148										
选修课总学分 Elective course credits				23										
最低毕业总学分 Total Credits				171										

七、分专业课程设置 (Curriculum)

1、专业核心课程 (Specialized Core Courses)：416 学时 (416 Hours)，25 学分 (25 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013112	地球化学 A Geochemistry A	64	4	46	18		考试 Exam	5	
SR013016	有机地球化学 Organic Geochemistry	32	2	16	16		考试 Exam	5	
SR013014	勘查地球化学 Exploration Geochemistry	48	3	24	24		考试 Exam	5	
SR013017	环境地球化学 Environmental Geochemistry	48	3	34	14		考试 Exam	6	
SR013113	地球化学多元统计分析 Multivariate statistical analysis of Geochemistry	32	2	16	16		考试 Exam	6	
SR014114	现代地球化学仪器分析 Modern Geochemical Analysis	48	3	34	14		考试 Exam	7	
SR013025	第四纪地质学与地貌学 Quaternary Geology and Geomorphology	48	3	24	24		考试 Exam	5	
SR013101	矿床学基础 Introduction to Ore Geology	48	3	32	16		考试 Exam	5	
SR014019	专业英语 Specialty English for Geochemistry	32	2	32			考试 Exam	7	
总计 Total		400	25						

2、**专业拓展课程** (Specialized Development Courses)：80 **学时** (80 Hours)，5 **学分** (5 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013075	遥感地质学 Remote Sensing Geology	48	3	24	24		考试 Exam	5	任选 4 学分 Optional
SS013105	矿石学与矿相学 A Ore Petrology and Microscopy A	32	2	12	20		考试 Exam	6	
SS013108	表生地球化学与生态地质学 Supergene geochemistry and Ecological geology	32	2	24	8		考查 Term Paper	6	
SR013015	岩石地球化学 Petrochemistry	32	2	12	20		考查 Term Paper	5	
SR013013	计算地球化学 Computational Geochemistry	32	2	16	16		考查 Term Paper	5	
SS014104	深时大数据与地球演化 Deep Time Big Data and Earth Evolution	32	2	24	8		考试 Exam	7	
	学科前沿课 Frontier Courses	16	1	16			考查 Term Paper	7	任选 1 学分 Optional
总计 Total		80	5						

3、**课程实践** (Course Practice)：29 **周** +128 **学时** (29 weeks and 128 hours)，28 **学分** (28Credits)

课程代码 Course Code	课程名称 Course Name	周数（学时） Week(hour)	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
PR013023	地球化学综合实践 Comprehensive Geochemical Practice	2 周	2	考查 Term Paper	3 夏	
PR013024	专业实习 Geological Field Trip	6 周	6	考查 Term Paper	3 夏	
PR014022	毕业论文 Graduation Thesis	12 周	6	考查 Term Paper	8	
总计 Total		20 周 +128 学时	14			

4、**课外实践** (Extracurricular practice)：6 **学分** (6 Credits)

包括主题教育活动、社会实践、志愿服务、勤工助学、学科竞赛、文体活动、创新创业活动、劳动实践等，其学分的认定按照教务处相关规定执行。

Extracurricular practice include Theme Education, Social Practice, Volunteer Service, Work-study Program, Discipline Competition, Cultural and Sports Activities, Innovative and Entrepreneurial Activities, Labor Practice and so on. The recognition of the credits for extracurricular practice shall be implemented according to the regulations of Academic Affairs Office.

地球信息科学与技术专业（大数据与数字地球）培养方案

一、专业培养目标

面向 21 世纪国家对新兴和边缘学科地球信息科学与技术的战略需求，培养掌握地球信息科学与技术专业基本理论和方法技术，具有地质学类知识、素质和智能决策的能力，具备一定的“数字地学”和“玻璃地球”理念的地学信息分析和管理水平，具有创新理念、实践技能和国际视野的专业技术人才。学生毕业后可在地学领域的科研院所、企事业单位等从事地学大数据构建、数据挖掘和智能管控等方面的科学研究及管理工作。经过 5 年的实际工作，可具备合格的卓越地质工程师和助理研究员的素质和能力，能运用地学大数据理论方法和计算机技术分析、研究并解决地球科学与工程的热点和前沿问题，能在科研与工作团队中担任技术骨干或负责人。

二、毕业要求

本专业毕业生应获得以下知识和能力：

（1）地学与计算机知识并重的应用能力：掌握从事工作所需的地学、数学与计算机等专业理论知识。

（2）综合研究能力：能应用所学专业知识和基本原理来识别、表达、分析和解决地学问题，利用地质、地球物理、地球化学和遥感等技术方法，提出针对地质矿产与环境问题的综合解决方案。

（3）使用现代工具能力：能开发、选择与使用相关技术、现代工程工具、信息技术工具和专业软件，并理解其局限性和适用范围。

（4）地质、资源、环境和可持续发展认知：了解与本行业和职业相关的地学研究、矿山生产、环境保护、可持续发展等方面的方针、政策和法规，能理解和评价研究问题及其解决方案对环境、社会可持续发展的影响。

（5）地质与社会知识关联：能对具体的地学问题进行合理分析，评价研究问题及其解决方案对社会、健康、安全、法律以及文化的影响。

（6）思想政和德育及职业规范：热爱社会主义祖国，拥护中国共产党的领导，树立正确的科学发展观，具有人文社会科学素养、社会责任感和良好的身体素质，能够在实践中理解并遵守工程职业道德和规范，履行责任。

（7）个人和团队意识：具有较强的团队合作的能力，能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色；

（8）沟通与交流能力：具有一定的国际视野和沟通与交流能力，能够就复杂地学问题与国内外同行及社会公众进行有效沟通和交流。

（9）项目管理与智能管控能力：理解并掌握相关管理原理与经济决策方法，能在地学与计算机管理的多学科环境的实际工作中应用。

（10）终身学习能力：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。能及时掌握新技术新方法，给出更优的问题解决方案。

三、主干学科

地质学、地质资源与地质工程。

四、学制与学位

学制四年。学生修满规定的最低毕业学分，达到毕业要求后，授予理学学士学位。

五、核心课程

专业核心课程：大数据导论、矿床学基础、算法设计与分析、地学信息三维可视化、Python 语言编程、GIS 二次开发、人工智能原理与应用、地学大数据构建、挖掘与应用、Geostatistics。

实践课程：实验物理、实验化学、机器学习课程设计、北戴河地质认识实习、周口店地质教学实习、燕山数字地球综合实训、专业实习、毕业设计（论文）。

Undergraduate Program in Earth Information Science and Technology (Big Data and Digital Earth)

1. Academic Objectives

To meet the strategic needs of the 21st century for the emerging and marginal disciplines of geoinformation science and technology, the aim of the subject of Earth Information Science and Technology (Big Data and Digital Earth) is to teach the students to master basic theories, skills, and methods to research geoscientific problems. The students would acquire geological knowledge, quality, and intelligent decision-making ability, have a certain level of geoinformation analysis and management with the concept of "Digital Geoscience" and "Glass Earth", and have innovative ideas with practical skills and international vision. After graduation, the students can engage in scientific research and management of geoscience big data construction, data mining, and intelligent management and control in scientific research institutes, enterprises, and institutions in the geoscience field. Based on 5 years' practical training after graduation, our graduates own the quality and abilities of an outstanding geological engineer and assistant researcher, and can be able to analyze, research, and solve hot and cutting-edge problems of Geoscience and engineering by using geoscience big data theory and computer technology, and be qualified in charge of scientific research and work team.

2. Graduation Requirements

In accordance with the requirements of the national engineering education professional accreditation, graduates should acquire the following knowledge and ability:

(1)Application ability of Geoscience and Computer knowledge: To master the professional theoretical knowledge of Geoscience, Mathematics and Computer.

(2)Comprehensive research ability: To apply professional knowledge and basic principles to identify, express, analyze and solve geological problems, and put forward comprehensive solutions for geological, mineral and environmental problems by using geological, geophysical, geochemical and remote sensing technology.

(3)Using modern tools: Can develop, select and use modern engineering and information technology tools and professional software, including simulation and prediction, and understand the limitations and scope of application.

(4)Environment and sustainable development of knowledge: Understand the research, design, production, environmental protection and sustainable development principles, policies and regulations, can evaluate the impact on the environment and social sustainable development.

(5)Professional norms: With the humanities and social science literacy, social responsibility and good physical quality, can understand and abide by the engineering ethics and norms, fulfill their responsibilities.

(6)Ideological, political, and moral norms: Love the socialist motherland, support the leadership of the Communist Party of China, establish a correct scientific outlook on development, have humanities and social science literacy, sense of social responsibility and good physical quality, be able to understand and

abide by the engineering professional ethics and norms in practice, and fulfill their responsibilities.

(7)Individual and team consciousness: Be able to be an individual, team member and responsible person in the team, with strong team work ability.

(8)Communication skills: Able to effectively communicate with both domestic and foreign counterparts and the public.

(9)Project management knowledge and ability: Understand and master the relevant management

principles and economic decision-making methods, and to apply them in the practical work of multi-disciplined environment.

Lifelong learning ability: Own a sense of independent learning and lifelong learning, and the ability to continuously learn and adapt to development.

3. Main Disciplines

Geology, Geological Resources and Geological Engineering.

4. Length of Schooling and Degree

The length of schooling is four years of full-time study. Students will be awarded the Bachelor Degree of Science when they have completed the required minimum credits and have met all other requirements.

5. Core Courses

Specialized Core Curses: Introduction to Big Data, Introduction to Ore Geology, Algorithm Design and Analysis, 3D Visualization of Geoscience Information, Python Language Programming, GIS Secondary Development, Artificial Intelligence Principle and Application, Geoscience Big Data Construction, Mining and Application, Geostatistics.

Practice Courses: Physics Experiments, Chemistry Experiments, Course design of machine learning, Geological Survey Field Trip in Beidaihe, Geological Survey Field Trip in Zhoukoudian, Comprehensive Training on Digital Earth inYanshan Region, Geological Field Trip, Graduation Design (Thesis).

六、最低毕业总学分要求及学分分配 (Minimum Required Credits and Distribution)

课程模块 Course module	课程类别 Course Classification	学时数 Hours	学分 Credits	学 期 Semester										
				1	2	1 夏	3	4	2 夏	5	6	3 夏	7	8
通识教育 Liberal Education	通识教育必修课程 Required Courses of General Education	666	36	11.25	9.25		4.25	5.25	1	3.25	1.25		0.25	0.25
	通识教育选修课程 Selective Courses of General Education	192	12											
专业教育 Professional Education	学科基础课程 Disciplinary Fundamental Courses	928	58	10	13		15	20						
	专业核心课程 Specialized Fundamental Courses	432	27							15	7		5	
	专业拓展课程 Specialized Development	80	5											
实践教育 Practical Education	课程实践 Course Practice	31 周 +128 学时	31		5	4	1		5			8	2	6
	课外实践 Extracurricular practice		6											
必修课总学分 Required course credits				152										
选修课总学分 Elective course credits				23										
最低毕业总学分 Total Credits				175										

七、分专业课程设置 (Curriculum)

1、专业核心课程 (Specialized Core Courses)：432 学时 (432 Hours)，27 学分 (27 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013115	大数据导论 Big data	48	3	32	16		考试 Exam	5	
SR013101	矿床学基础 Introduction to Ore Geology	48	3	32	16		考试 Exam	5	
DR043009	算法设计与分析 Algorithm design and analysis	48	3	16	32		考试 Exam	5	
SR013076	地理信息系统 Geographic Information System	48	3	24	24		考试 Exam	5	
SR013116	GIS 二次开发 Secondary development of GIS	48	3	32	16		考试 Exam	5	
SR013119	Python 语言编程 Python language programming	32	2	24	8		考试 Exam	6	
SR013121	人工智能原理与应用 Artificial Intelligence Theory and Application	32	2	24	8		考试 Exam	6	
SR013117	人工智能原理与应用 Artificial Intelligence Theory and Application	48	3	32	16		考查 Term Paper	6	
SR014118	Geostatistics	32	2	16	16		考试 Exam	7	英文课程
SR014120	地学大数据构建、挖掘与应用 Geoscience big data construction, mining and application	48	3	32	16		考试 Exam	7	
总计 Total		432	27	280	152				

2、**专业拓展课程** (Specialized Development Courses)：80 **学时** (80 Hours)，5 **学分** (5 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013075	遥感地质学 Remote Sensing Geology	48	3	24	24		考试 Exam	5	任选 4 学分 Optional
SR013014	勘查地球化学 Exploration Geochemistry	48	3	24	24		考试 Exam	5	
SR013017	环境地球化学 Environmental Geochemistry	48	3	34	14		考试 Exam	6	
SS014122	矿床统计预测 Statistical Prediction of Mineral Deposit	32	2	24	8		考试 Exam	7	
SS014104	深时大数据与地球演化 Deep Time Big Data and Earth Evolution	32	2	24	8		考试 Exam	7	
	学科前沿课 Frontier Courses	16	1				考查 Term Paper		任选 1 学分 Optional
总计 Total		80	5						

3、**课程实践** (Course Practice)：31 **周** +128 **学时** (31 weeks and 128 hours)，30 **学分** (30Credits)

课程代码 Course Code	课程名称 Course Name	周数（学时） Week(hour)	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
PR014123	机器学习地学课程设计 Geoscience Practice Course using machine learning	2 周	2	考查 Term Paper	7	
PR013124	燕山数字地球综合实训 Comprehensive Training on Digital Earth in Yanshan Region	2 周	2	考查 Term Paper	3 夏	
PR013125	专业实习 Geological Field Trip	6 周	6	考查 Term Paper	3 夏	
PR014126	毕业论文 Graduation Thesis	12 周	6	考查 Term Paper	8	
总计 Total		20周 +128 学时	16			

4、**课外实践** (Extracurricular practice)：6 **学分** (6 Credits)

包括主题教育活动、社会实践、志愿服务、勤工助学、学科竞赛、文体活动、创新创业活动、劳动实践等，其学分的认定按照教务处相关规定执行。

Extracurricular practice include Theme Education, Social Practice, Volunteer Service, Work-study Program, Discipline Competition, Cultural and Sports Activities, Innovative and Entrepreneurial Activities, Labor Practice and so on. The recognition of the credits for extracurricular practice shall be implemented according to the regulations of Academic Affairs Office.

资源勘查工程专业（固体矿产）培养方案

一、专业培养目标

本专业面向国家对矿产资源的战略需求，培养知识、能力、素质各方面均衡发展，适应地质工程师的素质和能力需要，掌握资源勘查工程专业基本理论和方法，获得作为资源勘查地质工程师必须的基本工程训练，具有创新精神、实践能力和国际视野，具备一定矿产资源勘查、评价和管理能力的专业技术人才。学生毕业后可在地矿领域的企事业单位、科研院所等从事矿产资源勘查评价、开发生产、科学研究及经营管理等方面工作，经过 5 年的实际工作，可具备合格的地质工程师的素质和能力，能够把握资源勘查工程的前沿问题，运用先进的勘查理论和科技手段，能发现、分析、研究并解决资源勘查中的工程问题，能在生产单位或科研团队中担任技术骨干或负责人。

二、毕业要求

按照全国工程教育专业认证的要求，本专业毕业生应获得以下知识和能力：

（1）工程知识：掌握从事资源勘查工程（固体矿产）工作所需的数学、自然科学、工程基础和专业知识的原理。

（2）问题分析能力：能应用已学知识和基本原理来识别、表达、分析、解决资源勘查工程（固体矿产）中的复杂问题，并获得有效的结论。

（3）设计 / 开发解决方案能力：能够利用地质、地球化学、地球物理等现代勘查技术，设计针对复杂资源勘查工程（固体矿产）问题的解决方案，设计满足资源勘查的工作流程和规范，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

（4）研究能力：能够基于科学原理，并采用科学方法对资源勘查工程（固体矿产）的复杂问题进行实验设计、信息采集、数据处理、信息综合、成果解释等分析和研究，最终获得合理有效 的结论。

（5）使用现代工具能力：能够针对资源勘查工程（固体矿产）复杂问题，开发、选择与使用相关技术、现代工程工具、信息技术工具和专业软件，包括模拟和预测，并能理解其局限性和适用范围。

（6）工程与社会知识：能够基于工程相关背景知识对资源勘查工程（固体矿产）具体问题进行合理分析，评价资源勘查专业工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响。

（7）环境和可持续发展知识：了解与本行业和职业相关的研究、设计、生产、环境保护、可持续发展等方面的方针、政策和法规，能够理解和评价固体矿产资源勘查与开发对环境、社会可持续发展的影响。

（8）职业规范：具有人文社会科学素养、社会责任感和良好的身体素质，能够在资源勘查工程实践中理解并遵守工程职业道德和规范，履行责任。

（9）个人和团队意识：能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色，具有较强的团队合作的能力。

（10）沟通能力：能够就复杂资源勘查工程（固体矿产）问题与国内外同行及社会公众进行有效沟通和交流；具有一定的国际视野。

（11）项目管理知识与能力：理解并掌握资源勘查工程相关管理原理与经济决策方法，并能在多学科环境的实际工作中应用。

（12）终身学习能力：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

三、主干学科

地质资源与地质工程。

四、学制与学位

学制四年。学生修满规定的最低毕业学分，达到毕业要求后，授予工学学士学位。

五、核心课程

专业核心课程：矿床学、矿石学与矿相学、地球化学（含有机地化）、勘查地球物理方法及应用、矿产勘查学、勘查地球化学、Mineral Systems and Exploration、采矿与选矿概论、固体矿产勘查规范、环境法与矿产资源法。

实践课程：实验物理、实验化学、北戴河地质认识实习、周口店地质教学实习、矿产勘查学课程设计、矿山基地资源勘查工程综合训练、专业实习、毕业设计（论文）。

Undergraduate Program in Resources Prospecting Engineering (Mineral Resources)

1. Academic Objectives

The major of Resources Prospecting Engineering (Mineral Resources) aims on the strategic needs of mineral resources of the nation, trains the professional and technical graduates who have all aspects of knowledge, ability and quality for resources prospecting engineering (solid mineral resource) and the related basic theory, basic methods and basic skills, obtains the basic engineering training as a resource exploration geological engineer, with a spirit of innovation, practical ability and international vision. The graduates have certain ability in the field of mineral resources exploration, evaluation and management, and can engage in production and research institutions and for administrative departments in the field related to resources prospecting engineering (mineral resource). Based on 5 years' practical training after graduation, our graduates own the quality and abilities of a qualified geological engineer, can observe the preceding issues of resources prospecting engineering and utilize the advanced prospecting theory and technology to discover, analyze, research and solve the engineering problems during the resources prospecting processes. The graduates can be the technical core person in the production unit or research team.

2. Graduation Requirements

In accordance with the requirements of the national engineering education professional accreditation, graduates should acquire the following knowledge and ability:

(1)Engineering knowledge: To master the principles of mathematics, natural science, engineering foundation and professional knowledge for the work of resource exploration engineering (solid mineral resources).

(2)Ability to analyze problems: To identify, express, analyze and solve complex problems in resource exploration engineering (solid mineral resources) by applying the learned knowledge and basic principles, and to obtain effective conclusions.

(3)Design/development to problem solving ability: Can use the knowledge and modern technology of geological, geochemical and geophysical exploration, design solutions for complex resource exploration engineering (solid mineral) problems, design the resource prospecting workflow and standards, and have innovative consciousness and can consider the factors of society, health, and safety, law, culture and environment.

(4)Research ability: Based on the principles of science, complete design, information collection, data processing, information synthesis, results interpretation, analysis and research, eventually to achieve a reasonable conclusion.

(5)Using modern tools: For the resource exploration engineering (solid mineral) complex problems, can develop, select and use relevant technology and modern engineering tools and the information technology tools and professional software, including simulation and prediction, and understand the limitations and scope of application.

(6)Engineering and social knowledge: Be able to evaluate the impact of resource exploration

engineering practices and complex engineering solutions on social, health, safety, law, and culture.

(7)Environment and sustainable development of knowledge: Understand the research, design, production, environmental protection and sustainable development principles, policies and regulations, can evaluate solid mineral resources exploration and development of impact on the environment and social sustainable development.

(8)Professional norms: With the humanities and social science literacy, social responsibility and good physical quality, can be in the resource exploration engineering practice to understand and abide by the engineering ethics and norms, fulfill their responsibilities.

(9)Individual and team consciousness: Be able to be an individual, team member and responsible person in the team, with strong team work ability.

(10)Communication skills: Able to effectively communicate with both domestic and foreign counterparts and the public on complex resource exploration projects (solid mineral resources).

(11)Project management knowledge and ability: Understand and master the relevant management principles and economic decision-making methods of resource exploration engineering, and to apply them in the practical work of multi-disciplined environment.

(12)Lifelong learning ability: Own a sense of independent learning and lifelong learning, and the ability to continuously learn and adapt to development.

3.Main Disciplines

Geological Resources and Geological Engineering.

4.Length of Schooling and Degree

The length of schooling is four years of full-time study. Students will be awarded the Bachelor Degree of Engineering when they have completed the required minimum credits and have met all other requirements.

5.Core Courses

Specialized Core Courses: Ore Deposit Geology, Ore Petrology and Microscopy, Geochemistry (Inc. organic geochemistry), Geophysical Prospecting Method and its Application, Mineral Prospecting and Exploration, Exploration Geochemistry, Mineral Systems and Exploration, Introduction to Mining and Mineral Processing, Solid Mineral Exploration Standards, Environmental Law and Mineral Resources Law.

Practice Courses: Physics Experiments, Chemistry Experiments, Geological Survey Field Trip in Beidaihe, Geological Survey Field Trip in Zhoukoudian, Practice Course of Minerals Prospecting and Exploration, Comprehensive Training on Resource Exploration Engineering in Mine Base, Geological Field Trip, Graduation Design (Thesis).

六、最低毕业总学分要求及学分分配 (Minimum Required Credits and Distribution)

课程模块 Course module	课程类别 Course Classification	学时数 Hours	学分 Credits	学 期 Semester										
				1	2	1 夏	3	4	2 夏	5	6	3 夏	7	8
通识教育 Liberal Education	通识教育必修课程 Required Courses of General Education	666	36	11.25	9.25		4.25	5.25	1	3.25	1.25		0.25	0.25
	通识教育选修课程 Selective Courses of General Education	192	12											
专业教育 Professional Education	学科基础课程 Disciplinary Fundamental Courses	928	58	10	13		15	20						
	专业核心课程 Specialized Fundamental Courses	400	25							14	9		2	
	专业拓展课程 Specialized Development	80	5											
实践教育 Practical Education	课程实践 Course Practice	31 周 +128 学时	31		5	4	1		5		2	8		6
	课外实践 Extracurricular practice		6											
必修课总学分 Required course credits				150										
选修课总学分 Elective course credits				23										
最低毕业总学分 Total Credits				173										

七、分专业课程设置 (Curriculum)

1、专业核心课程 (Specialized Core Courses)：400 学时 (400 Hours)，25 学分 (25 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013050	矿床学 Ore Deposit Geology	64	4	44	20		考试 Exam	5	
SR013051	矿石学与矿相学 Ore Petrology and Microscopy	48	3	16	32		考试 Exam	5	
SR013012	地球化学（含有机地化） Geochemistry (Inc. Organic Geochemistry)	48	3	24	24		考试 Exam	5	
SR103050	勘查地球物理方法及应用 Geophysical Prospecting Method and its Application	32	2	16	16		考试 Exam	5	
SR013053	矿产勘查学 Mineral Prospecting and Exploration	64	4	48	16		考试 Exam	6	
SR013018	勘查地球化学 Exploration Geochemistry	32	2	24	8		考试 Exam	5	
SR014056	固体矿产勘查规范 Solid Mineral Exploration Standards	32	2	32			考查 Term Paper	6	
SR074001	环境法与矿产资源法 Environmental Law and Mineral Resources Law	16	1	16			考试 Exam	7	
SR013127	Mineral systems and exploration	32	2	24	8		考试 Exam	6	
SR014055	采矿与选矿概论 Introduction to Mining and Mineral Processing	16	1	16			考试 Exam	7	
SR013052	矿产经济与管理 Mineral Resources Economics and Management	16	1	16			考查 Term Paper	6	
总计 Total		400	25	276	124				

2、**专业拓展课程** (Specialized Development Courses)：80 **学时** (80 Hours)，5 **学分** (5 Credits)

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SR013075	遥感地质学 Remote Sensing Geology	48	3	24	24		考试 Exam	5	任选 4 学分 Optional
SS014122	矿床统计预测 Statistical Prediction of Mineral Deposit	32	2	24	8		考试 Exam	7	
SS014128	成矿规律与成矿预测 Metallogenic prediction and metallogenic regularity	32	2	32			考试 Exam	7	
SS014104	深时大数据与地球演化 Deep Time Big Data and Earth Evolution	32	2	24	8		考试 Exam	7	
SS013108	表生地球化学与生态地质学 Supergene geochemistry and Ecological geology	32	2	24	8		考查 Term Paper	6	
	学科前沿课 Frontier Courses	16	1	16			考查 Term Paper	7	任选 1 学分 Optional
总计 Total		80	5						

3、**课程实践** (Course Practice)：31 **周** +128 **学时** (31 weeks and 128 hours)，30 **学分** (30 Credits)

课程代码 Course Code	课程名称 Course Name	周数（学时） Week(hour)	学分 Credits	考核方式 Assessment	开课学期 Semester	备注 Notes
PR013058	矿产勘查学课程设计 Practice Course of Minerals Prospecting and Exploration	2 周	2	考查 Term Paper	6	
PR013060	矿山基地资源勘查工程综合训练 Comprehensive Training on Resource Exploration Engineering in Mine Base	2 周	2	考查 Term Paper	3 夏	
PR013061	专业实习 Geological Field Trip	6 周	6	考查 Term Paper	3 夏	
PR014059	毕业设计（论文） Graduation Design (Thesis)	12 周	6	考查 Term Paper	8	
总计 Total		22周 +128 学时	16			

4、**课外实践** (Extracurricular practice)：6 **学分** (6 Credits)

包括主题教育活动、社会实践、志愿服务、勤工助学、学科竞赛、文体活动、创新创业活动、劳动实践等，其学分的认定按照教务处相关规定执行。

Extracurricular practice include Theme Education, Social Practice, Volunteer Service, Work-study Program, Discipline Competition, Cultural and Sports Activities, Innovative and Entrepreneurial Activities, Labor Practice and so on. The recognition of the credits for extracurricular practice shall be implemented according to the regulations of Academic Affairs Office.

八、毕业要求与培养目标矩阵（工程教育认证类专业）

毕业要求	培养目标				
	目标 1：具有扎实的资源勘查工程基本理论和专业知识	目标 2：具有较强的人文心理素质，良好的工程职业道德	目标 3：具备分析、评价、解决资源勘查工程问题的能力	目标 4：具备再学习、再提升的能力	目标 5：具有一定国际视野、团队协作精神、沟通管理能力
毕业要求 1：工程知识	√		√	√	√
毕业要求 2：问题分析	√	√	√		√
毕业要求 3：设计 / 开发解决方案	√	√	√		√
毕业要求 4：研究能力	√	√	√	√	√
毕业要求 5：使用现代工具	√	√	√	√	
毕业要求 6：工程与社会	√	√			
毕业要求 7：环境和可持续发展知识	√	√	√		
毕业要求 8：职业规范		√		√	
毕业要求 9：个人和团队		√		√	
毕业要求 10：沟通能力		√	√		√
毕业要求 11：项目管理	√	√		√	
毕业要求 12: 终身学习		√		√	

九、课程与毕业要求关系矩阵（工程教育认证专业类专业）

课程名称 \ 毕业要求	(1) 工程知识	(2) 问题分析	(3) 设计／开发解决方案	(4) 研究	(5) 使用现代工具	(6) 工程与社会	(7) 环境和可持续发展	(8) 职业规范	(9) 个人和团队	(10) 沟通	(11) 项目管理	(12) 终身学习
思想道德与法制			H					H		L		
中国近现代史纲要						M		L				
马克思主义基本原理		L						M			L	M
毛泽东思想和中国特色社会主义理论体系概论								H				
习近平新时代中国特色社会主义思想概论		L				M	H					M
形势与政策						L	M					
大学生心理素质教育				M						L		L
大学英语					M					H		L
大学英语素质拓展课					M					H		L
体育（系列课程）									L			H
大学计算机			H		H							
大学生职业生涯规划与就业指导									M			M

毕业要求 课程名称	(1) 工程知识	(2) 问题分析	(3) 设计／开发解决方案	(4) 研究	(5) 使用现代工具	(6) 工程与社会	(7) 环境和可持续发展	(8) 职业规范	(9) 个人和团队	(10) 沟通	(11) 项目管理	(12) 终身学习
地质类专业导论	H											
高等数学 A	M		H	L								
线性代数	M		H	L								
概率论与数理统计	M		H	L								
大学物理	H	M	H	L								
大学化学	H	M	H	L								
物理化学 B	H	M	H	L								
测量学 A	H			L								
地球科学概论	H	M	L	H								
结晶学与矿物学		M		H								
晶体光学		M		H								
古生物学		M		H			L					

毕业要求 / 课程名称	(1) 工程知识	(2) 问题分析	(3) 设计／开发解决方案	(4) 研究	(5) 使用现代工具	(6) 工程与社会	(7) 环境和可持续发展	(8) 职业规范	(9) 个人和团队	(10) 沟通	(11) 项目管理	(12) 终身学习
地史学		M		H			L					
岩石学	H		L	H								
构造地质学	H	M	L	H								
矿床学		M	L	H								
矿石学与矿相学		M	L	H								
地球化学（含有机地化）		M	L	H								
勘查地球物理方法及应用	H	M	L	H								
矿产勘查学			H	H								L
Mineral systems and exploration			L	H								L
固体矿产勘查规范	H					H		H				
环境法与矿产资源法							H	H				
成矿规律与成矿预测	H	M	H	H								
矿床统计预测		H		H								
采矿与选矿概论	H			L		H	H					

毕业要求 课程名称	(1) 工程知识	(2) 问题分析	(3) 设计／开发解决方案	(4) 研究	(5) 使用现代工具	(6) 工程与社会	(7) 环境和可持续发展	(8) 职业规范	(9) 个人和团队	(10) 沟通	(11) 项目管理	(12) 终身学习
矿产经济与管理						H				L	H	
遥感地质学	L			H	H							
勘查地球化学	L			M								
军事理论及训练									H	M		
思想政治社会实践									L	M		H
实验物理		H	M						L			
实验化学		H	M						L			
北戴河地质认识实习	M		M	H			L		H	H		
周口店地质教学实习	M		M	H			L		H	H		
矿产勘查学课程设计	H		M	H			M		H	H		
矿山基地资源勘查工程综合训练		H		M					H	M		L
专业实习	M	M		M					H			
毕业设计（论文）	L	H	H	H	M							M

注：H 表示课程对毕业要求指标支撑度高；M 表示课程对毕业要求指标支撑度中等；L 表示课程对毕业要求指标支撑度低。

附：地球科学与资源学院学科前沿课

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SS010001	超大陆旋回 Supercontinent cycle	16	1	16			考查 Term Paper	7、8	任选 1 学分 Optional
SS010003	微生物碳酸盐岩 Microbial Carbonate	16	1	16			考查 Term Paper	7、8	
SS010006	资源与环境遥感新进展 New progress in remote sensing of resources and environment	16	1	16			考查 Term Paper	7、8	
SS010007	深部矿产勘查导论 Introduction to Deep Ore Exploration	16	1	16			考查 Term Paper	7、8	
SS010008	火成岩定量化结构分析：理论、方法和实践 Quantitative texture analysis of igneous rocks: theory, method and application	16	1	12	4		考查 Term Paper	7、8	
SS010009	矿床学研究方法与前沿问题 Research methods and frontier issues of ore deposits	16	1	12	4		考查 Term Paper	7、8	
SS010012	隐伏矿床定位预测理论与方法 The progress on prediction theory and method of concealed ore deposits	16	1	16			考查 Term Paper	7、8	
SS010014	化学地球动力学导论 Introduction of Chemical Geodynamics	16	1	16			考查 Term Paper	7、8	
SS010015	大陆地壳的生长与保存 Growth and Perservation of Continental Crust	16	1	16			考查 Term Paper	7、8	

课程代码 Course Code	课程名称 Course Name	总学时 Hours	学分 Credits	讲课学时 Lecture	实验学时 Experiment	线上学时 Online	考核方式 Assessment	开课学期 Semester	备注 Notes
SS010016	低温矿床与分散元素矿床成矿作用 Low temperature deposits and mineralization of dispersed element deposits	16	1	16			考查 Term Paper	7、8	任选 1 学分 Optional
SS010018	最新矿床类型成矿模式与勘查模型 Metallogenic model and exploration model of the latest deposit types	16	1	16			考查 Term Paper	7、8	
SS010021	地质遗迹解说和研学旅行进展 Advance in goheritage interpretation and study tour	16	1	16			考查 Term Paper	7、8	
SS010094	沉积地球化学在环境分析中的应用 Sedimentary geochemistry in environmental analysis	16	1	16			考查 Term Paper	7、8	
SS014130	地球关键带研究前沿 Research Frontiers of Earth Critical Zone	16	1	15	1		考查 Term Paper	7、8	
SS014131	多接收杯等离子体质谱仪的原理与应用 The principle and application of MC-ICPMS	16	1	12	4		考查 Term Paper	7、8	
SS014132	宜居性地球的形成和演化 Formation and Evolution of a Habitable Earth	16	1	16			考查 Term Paper	7、8	
SS014133	云计算 Cloud Computing Introductory Theory	16	1	16			考查 Term Paper	7、8	
SS010013	重大地质事件的岩浆记录 Magmatic records of ctitical geological events	16	1	16			考查 Term Paper	7、8	