中国地质大学（武汉）

勘查技术与工程（勘查地球物理方向）

专业培养方案 （2015 版）

勘查技术与工程专业（勘查地球物理方向）培养方案

专业名称与代码：勘查技术与工程　081402

专业培养目标：以学生全面发展为本，本专业培养具有良好思想道德素质、人文素养和职业道德，具备扎实的数学、物理、计算机和地球科学基础，掌握勘查技术与工程理论与方法技术，具有创新意识、管理与协作能力和国际化视野，能够解决勘查地球物理复杂工程问题的高素质工程技术人才。

预期毕业生通过持续学习和职业发展，达到专业培养目标。主要包括：①开展国内外相关领域合作交流，掌握勘查技术与工程领域发展前沿和新进展；②能发现和分析勘查技术与工程过程中的关键科技问题，并提出合理的解决方案；③掌握多种勘查地球物理方法野外观测、数据采集、资料处理与综合地质解释基本技能，能独立承担勘查技术与工程项目的设计、实施和管理工作；④在资源勘查与开发利用，地质灾害预测和防范，城市地下空间探测及水利、电力、交通等企事业单位担任技术骨干或负责人。

专业毕业要求：

1.工程知识：掌握数学、物理学、地质学等方面的基本理论、基本知识和基本技能，具有扎实而宽广的专业基础知识，并能用于解决勘查技术与工程中复杂工程问题。

2.问题分析：系统掌握勘查技术与工程的基本理论与方法原理，了解各种地球物理探测技术的特点，并能分析和研究勘查技术与工程的复杂工程问题。

3.工程实践与研究：掌握多种常用勘查地球物理方法野外观测、数据采集、数据处理与解释方法的基本技能，能够设计针对勘查技术与工程中复杂工程问题的解决方案。能够基于科学原理并采用科学方法对复杂工程问题进行研究，包括设计实验、对数据进行处理与解释、并得出合理有效的结论。

4. 使用现代工具：能够针对勘查技术与工程中复杂工程问题，开发、选择与使用恰当的技术、资源、现代仪器和信息技术工具，实现对复杂工程问题的分析与模拟，并能够理解其局限性。

5. 工程、社会及可持续发展：能够基于勘查技术与工程相关背景知识进行合理分析，评价勘查技术与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，并理解应承担的责任。能够理解和评价针对勘查技术与工程复杂工程问题的专业工程实践对环境、社会可持续发展的影响。

6. 职业规范：具有人文社会科学素养、社会责任感，能够在勘查技术与工程实践中理解并遵守工程职业道德和规范，履行责任。

7. 个人与团队：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：能够就勘查技术与工程中复杂工程问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流

9. 项目管理：理解并掌握工程管理原理与经济决策方法，并能在多学科环境中应用

10. 终身学习：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。

毕业要求实现及途径：

序号	毕 业 要 求	实现途径（教学过程）
1	工程知识：掌握数学、物理学、地质学等方面的基本理论、基本知识和基本技能，具有扎实而宽广的专业基础知识，并能用于解决复杂勘查技术与工程问题。	①课堂教学：高等数学 A、线性代数与矢量分析、概率论与数理统计 B、复变函数与积分变换、数学物理方程、数值分析、大学物理 B、大学物理实验 A；地质学基础、矿物岩石学、矿床学、构造地质学 B、地质教学实习（三峡）、测量学 A、测量教学实习 A 等 ②课外学习：专题讲座、学术报告
2	问题分析：系统掌握勘查地球物理学的基本理论与方法原理，了解各种地球物理探测技术的特点，并能分析和研究复杂勘查技术与工程问题。	①课堂教学：勘查地球物理导论、岩石物理学、场论、弹性波理论基础、工程地质学基础、石油及天然气地质学、海洋地质学、重力勘探、磁法勘探、电法勘探原理、地震勘探原理 ②课外学习：课程作业、大学生科技立项、学科前沿调研报告等
3	工程实践与研究：掌握多种常用勘查地球物理方法野外观测、数据采集、数据处理与解释方法的基本技能，具备从事能源及矿产资源勘察、工程基础勘察、地质灾害的预测与防治、环境监测与保护等领域工作的能力。	①课堂教学：地震资料采集与处理、能源地震勘探新方法技术、地震勘探资料解释、地震沉积相解释、工程地震勘探、工程地震勘探实习、地震资料处理与解释实习、重磁勘探新方法技术、重磁资料处理与解释、重磁资料处理与解释实习、电（磁）法资料处理与解释、大地电磁测深、瞬变电磁法、管线探测与高密度电法原理、地面核磁共振方法与应用、探地雷达方法原理及应用、地质雷达数据采集与处理实习、地球物理测井、测井资料处理与解释实习、勘查地球物理导论、海洋地球物理概论、地球物理反演概论、地球物理勘探实验、地球物理教学实习（北戴河）A ②课外学习：课程作业、大学生科技立项、学科前沿动态调研报告等
4	使用现代工具：能够针对勘查技术与工程中复杂工程问题，开发、选择与使用恰当的技术、资源、现代仪器和信息技术工具，实现对复杂工程问题的分析与模拟，并能够理解其局限性。	①课堂教学：计算机高级语言、计算机高级语言课程设计、Matlab 语言及应用、计算地球物理、文献检索、数字信号处理 B、现代地球物理仪器与应用、毕业设计（论文）、毕业实习 ②课外学习：课外科技实践、大学生科技立项、专题讲座、自主学习等
5	工程、社会及可持续发展：能够基于勘查技术与工程相关背景知识进行合理分析，评价勘查技术与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，并理解	①课堂教学：思想道德修养与法律基础、法律与文学、勘查地球物理导论、工程经济学概论、形势与政策 ②课外学习：课程作业、专题讲座、社会调查实践、专题讲座等

序号	毕 业 要 求	实现途径（教学过程）
	应承担的责任。能够理解和评价针对勘查技术与工程复杂工程问题的专业工程实践对环境、社会可持续发展的影响。	
6	职业规范：具有人文社会科学素养、社会责任感，能够在勘查技术与工程实践中理解并遵守工程职业道德和规范，履行责任。	①课堂教学：马克思主义基本原理、毛泽东思想与中国特色社会主义理论体系概论、中国近现代史纲要、军事理论、军事训练、思想道德修养与法律基础、法律与文学、体育、心理学与自我成长、勘查地球物理导论、职业规划与就业指导 ②课外学习：课程作业、社会调查实践、专题讲座等
7	个人与团队：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。	①课堂教学：军事训练、测量教学实习 A、社会调查、地质认识实习（秭归）、地震资料处理与解释实习、电磁法新方法技术实习（高密度电法、瞬变电磁、管线探测）、重磁资料处理与解释实习、地质雷达数据采集与处理实习、工程地震勘探实习、测井资料处理与解释实习、地球物理教学实习（北戴河）A ②课外学习：课程作业、大学生科技立项、专题讲座、参加教师科研项目等
8	沟通：能够就勘查技术与工程中复杂工程问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。	①课堂教学：社会调查、毕业论文（设计）、地球物理科技论文写作、大学英语，专业英语 ②课外学习：课程作业、大学生社会调查实践、专业实习、大学生科技立项、专题讲座、参加教师科研项目等
9	项目管理：理解并掌握工程管理原理与经济决策方法，并能在多学科环境中应用。	①课堂教学：勘查地球物理导论、现代管理基础、工程经济学概论 ②课外学习：课程作业、大学生科研立项、生产实习、社会调查实践、专题讲座、参加教师科研项目等
10	终身学习：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。	①课堂教学：社会调查、毕业实习、毕业论文（设计）、文献检索、能源地震勘探新方法技术、重磁勘探新方法技术 ②课外学习：课程作业、学科竞赛、发明创造、科研报告、社会调查实践、专题讲座等

主干学科：地质资源与地质工程

专业核心课程：数字信号处理 B；弹性波理论基础；重力勘探；磁法勘探；电（磁）法勘探；地震勘探；电（磁）法资料处理与解释；地震资料采集与处理；地震勘探资料解释；地球物理测井；重磁资料处理与解释。

主要专业实验：地球物理勘探实验、岩石物性测量（密度、磁化率、电阻率、极化率、速度等）、

重力仪及野外测量实验、磁力仪及野外测量实验、**常规直流电水槽实验、地震波超声波物理模拟实验、常规测井实验、浅层地震实验**

主要实践性教学环节：C 语言课程设计 B、测量教学实习 A、地震资料处理与解释实习、电磁法新方法技术实习、重磁资料处理和解释实习、地质雷达数据采集与处理实习、工程地震勘探实习、测井资料处理与解释实习、地质教学实习（秭归）A、地球物理专业教学实习（北戴河）A、毕业实习、毕业设计（论文）等。

修业年限：四年。

授予学位：工学学士。

相近专业：地球物理学；资源勘查工程、地质工程

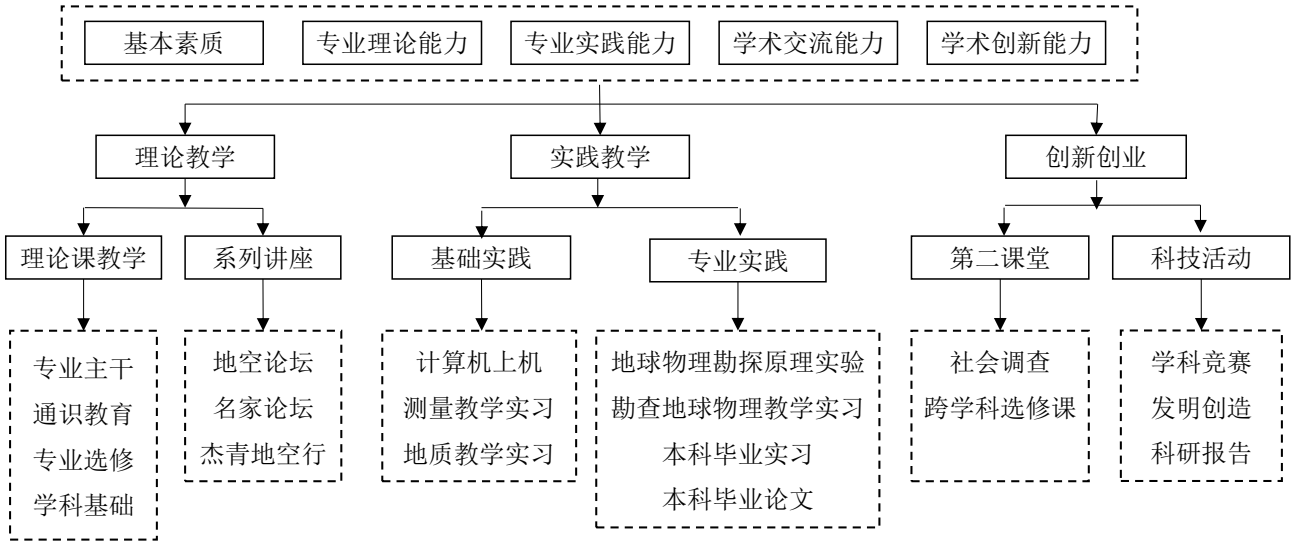

图 1　勘查技术与工程专业（勘查地球物理方向）本科培养方案

Undergraduate Program For Exploration Technology & Engineering

(Exploration Geophysics)

Specialty and Code: Exploration Technology & Engineering 071081

Educational Objective:

Taking the all-round development of students as the foremost, the students enrolled in the program aim to have good ideological and moral quality, humanistic quality and professional ethics. They will be equipped with solid foundations of mathematics, physics, computers and geosciences, and they are expected to master the basic theories and techniques of exploration technology and engineering. They need to have innovative awareness, management and collaboration capabilities and international vision. They are aimed to be the high quality engineering talents who can solve complex engineering problem in exploration geophysics.

Graduates are expected to achieve professional training goals through continuous learning and career development, which mainly includes: (1) conducting cooperation and exchanges in related fields at home and abroad, mastering the development frontier and new progress in exploration technology and engineering field; (2) discovering and analyzing key scientific and technological problems in exploration technology and engineering process, and proposing reasonable solutions; (3) mastering the multiple exploration geophysical methods, including the field observation, data collection, data processing and comprehensive geological interpretation basic skills, being enable to independently undertake the design, implementation and management of exploration technology and engineering projects; (4) acting as the technical backbone or responsible person in resource exploration and development, geological disaster prediction and prevention, urban underground space exploration and water conservancy, electric power, transportation and other enterprises and institutions.

Graduation Requirements and ways to achieve：

1. Engineering knowledge: master the basic theories, knowledge and skills in mathematics, physics, geology, etc., with a solid and broad professional basic knowledge, and can solve complex engineering problems in exploration technology and engineering.
2. Problem analysis: master the basic theory and method principles of exploration technology and engineering, understand the characteristics of various geophysical exploration technologies, and can study the complex engineering problems of exploration technology and engineering.
3. Engineering practice and research: master the basic skills of a variety of commonly used geophysical methods for field observation, data acquisition, data processing and interpretation methods, and design solutions for complex engineering problems in exploration techniques and engineering. Have the ability to study complex engineering problems based on scientific principles and scientific methods, including designing experiments, processing and interpreting data, and drawing reasonable and effective conclusions.

4. Use modern tools: develop, select, and use the right technologies, resources, modern instruments, and information technology tools for complex engineering problems in exploration technology and engineering to analyze and simulate complex engineering problems and understand their limitations.
5. Engineering, society and sustainability: ability to conduct rational analysis based on background knowledge of exploration techniques and engineering, evaluate the impact of exploration techniques and engineering practices and complex engineering problem solutions on society, health, safety, law and culture, and understand the responsibility. Ability to understand and evaluate the impact of professional engineering practices on exploration technology and engineering complex engineering issues on environmental and social sustainability.
6. Professional norms: have humanities and social science literacy and social responsibility, understand and abide by engineering professional ethics and norms, fulfill the responsibilities in exploration technology and engineering practice.
7. Individuals and teams: ability to assume the roles of individuals, team members, and responsible individuals in a multidisciplinary team.
8. Communication: effective communication with industry peers and the public on complex engineering issues in exploration technology and engineering, including writing reports and design contributions, presenting statements, articulating or responding to instructions. Have a certain international perspective and be able to communicate in a cross-cultural context.
9. Project management: understand and master engineering management principles and economic decision-making methods, and apply them in a multidisciplinary environment.
10. Lifelong learning: have the wareness of self-learning and lifelong learning, with the ability to continuously learn and adapt to development.

Graduation requirements and ways to achieve：

No.	Graduation requirements	Ways to achieve（teaching process）
1	Engineering knowledge: master the basic theories, knowledge and skills in mathematics, physics, geology, etc., with a solid and broad professional basic knowledge, and can solve complex engineering problems in exploration technology and engineering.	**①Classroom Teaching：** Advanced Mathematics (A); Linear Algebra and Vector Analysis; Probability and Statistics (B); Complex Function and Integral Transform; Equations of Mathematical Physics; Numerical Analysis; Physics (B) ; Physics Experiments (A); Foundation of Geology; Mineralogy and Lithology; Structural Geology (B); Geology Practice (Three Gorges); Survey (A); Surveying Practice(A) **②Out-of-class Learning：** Special Lectures Academic Reports, etc.
2	Problem analysis: master the basic theory and method principles of exploration technology and engineering, understand the characteristics of various geophysical exploration technologies, and study the complex engineering problems of exploration technology and engineering.	**①Classroom Teaching：** Introduction of Exploration Geophysics; Rock Physics; Potential Field Theory; Foundation of Elastic Wave Theory; Foundation of Engineering Geology; Geology of Oil and Gas (D); Marine Geology; Gravity Exploration; Magnetic Exploration; Electromagnetic (EM) Exploration; Seismic Exploration; **②Out-of-class Learning：** Course Assignments; University Student Science and Technology Projects; Reports of Research Frontiers, etc.
3	Engineering practice and research: master the basic skills of a variety of commonly used geophysical methods for field observation, data acquisition, data processing and interpretation methods, and design solutions for complex	**①Classroom Teaching：** Seismic Data Acquisition and Processing New method and technology of Energy Resources Seismic Exploration; Seismic Data Interpretation; Seismic Sedimentary Facies Interpretation; Engineering Seismic Prospecting; Engineering Seismic Prospecting Practice;

No.	Graduation requirements	Ways to achieve（teaching process）
	engineering problems in exploration techniques and engineering. Have the ability to study complex engineering problems based on scientific principles and scientific methods, including designing experiments, processing and interpreting data, and drawing reasonable and effective conclusions.	Seismic Data Acquisition and Processing Practice; New method and technology of Gravity & Magnetic Exploration; Gravity and Magnetic Data Processing and Interpretation; Gravity and Magnetic Data Processing and Interpretation Practice; EM Data Processing and Interpretation; Magnetotelluric Sounding; Transient Electromagnetic Method; Pipeline detection & High Density Resistivity Method Principles; Surface NMR Method and its Application; Computational Geophysics; Ground Penetrating Radar Principles & Applications; Ground Penetrating Radar Acquisition and Processing Practice; Geophysical Logging; Geophysical Logging Data Processing & Interpretation Practice; Introduction of Exploration Geophysics; Introduction to Marine Geophysics; Introduction to Geophysical Inversion; Geophysical Exploration Experiment; Geophysics Practice Teaching Beidaihe (A); **②Out-of-class Learning：** Course Assignments; University Student Science and Technology Projects; Reports of Research Frontiers, etc.
4	Use modern tools: develop, select, and use the right technologies, resources, modern instruments, and information technology tools for complex engineering problems in exploration technology and engineering to analyze and simulate complex engineering problems and understand their limitations.	**①Classroom Teaching：** Computer Advanced Language; Programming for Advanced Computer Language; MATLAB Programming and its Application; Computational Geophysics; Document retrieval; Digital Signal Processing (B); Modern Geophysical Instruments and Their Applications; Major Practice for Graduation; Bachelor Thesis; Major Practice for Graduation; **②Out-of-class Learning：** Extracurricular Technology Practice;

No.	Graduation requirements	Ways to achieve（teaching process）
		University Student Science and Technology Projects; Special Lectures; Independent Learning, etc.
5	Engineering, society and sustainability: ability to conduct rational analysis based on background knowledge of exploration techniques and engineering, evaluate the impact of exploration techniques and engineering practices and complex engineering problem solutions on society, health, safety, law and culture, and understand the responsibility. Ability to understand and evaluate the impact of professional engineering practices on exploration technology and engineering complex engineering issues on environmental and social sustainability.	**①Classroom Teaching：** Cultivation of Ethics and Fundamentals of Law; Law and Literature; Introduction of Exploration Geophysics; Introduction to Engineering Economics; Situation and Policy; **②Out-of-class Learning：** Extracurricular Technology Practice; University Student Science and Technology Projects; Special Lectures; Independent Study, etc.
6	Professional norms: have humanities and social science literacy and social responsibility, understand and abide by engineering professional ethics and norms, fulfill the responsibilities in exploration technology and engineering practice.	**①Classroom Teaching：** Basic Principles of Marxism; Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics; Introduction to Modern & Contemporary History of China; Military Theory; Military Training; Cultivation of Ethics and Fundamentals of Law; Law and Literature; Physical Education; Psychology and Self-growth; Career Planning and Employment Guidance; Introduction of Exploration Geophysics; **②Out-of-class Learning：** Course Assignments; Social Survey Practice; Special Lectures, etc.

No.	Graduation requirements	Ways to achieve（teaching process）
7	Individuals and teams: ability to assume the roles of individuals, team members, and responsible individuals in a multidisciplinary team.	**①Classroom Teaching：** Military Training; Surveying Practice(A) Social Survey Geology Practice Zigui Seismic Data Processing and Interpretation Practice; New method and technology Practice of EM (High Density Resistivity Method, Transient Electromagnetic method, Pipeline Detection) Ground Penetrating Radar Data Acquisition and Processing Practice; Engineering Seismic Practice; Geophysical Logging Data Processing and Interpretation Practice; Geophysics Teaching Practice Beidaihe (A) **②Out-of-class Learning：** Course Assignments; College Student Science and Technology Projects; Special Lectures; Participation in Teacher’s Research Projects, etc.
8	Communication: effective communication with industry peers and the public on complex engineering issues in exploration technology and engineering, including writing reports and design contributions, presenting statements, articulating or responding to instructions. Have a certain international perspective and be able to communicate in a cross-cultural context.	**①Classroom Teaching：** Social Survey; Graduation thesis (design); Geophysical Scientific Paper Writing; College English; Professional English; **②Out-of-class Learning：** Course Assignments; College Student Social Survey Practice; Geophysics Practice; College Student Science and Technology Projects; Special Lectures; Participation in Teacher’s Research Projects, etc.
9	Project management: understand and master engineering management principles and economic decision-making methods, and apply them in a multidisciplinary environment.	**①Classroom Teaching：** Introduction to Exploration Geophysics; Modern Management Foundation; Introduction to Engineering Economics; **②Out-of-class Learning：** Course Assignments; University Student Research Projects; Production Practice; Social Survey Practices

No.	Graduation requirements	Ways to achieve（teaching process）
		Special Lectures; Participation in Teacher's Research Projects, etc.
10	Continual learning: have the awareness of self-learning and lifelong learning, with the ability to continuously learn and adapt to development.	**①Classroom Teaching：** Social Survey; Graduation Practice; Graduation Thesis (Design); Document Retrieval; New Method and Technology of Energy Seismic Exploration; New Method and Technology of Gravity and Magnetic Exploration; **②Out-of-class Learning：** Course Assignments; Subject Competition; Invention and Creation; Research Report; Social Survey Practice; Special Lectures, etc.

Major Disciplines: Geological Resources and Geological Engineering;

Main Courses: Digital Signal Processing B, Foundation of Elastic Wave Theory,

Gravity Exploration, Magnetic Exploration, Electric and Magnetic (EM) Exploration, Seismic Exploration, EM Data Processing and Interpretation, Seismic Data Acquisition and Processing, Seismic Data Interpretation, Geophysical Logging, Gravity and Magnetic Data Processing and Interpretation

Lab Experiments: Experiments for Exploration Geophysics, Rock Physics Measurement (density, magnetic susceptibility, resistivity, polarizability, velocity, etc.), Gravimeter and Field Measurement Experiment, Magnetometer and Field Measurement Experiment, Conventional DC Electric Water Tank Experiment, Seismic Wave Ultrasonic Physics Simulation Experiment, Conventional Logging Experiment, Shallow Seismic Experiment.

Practical Work: C Language Curriculum Design B, Surveying Practice A, Seismic Data Processing and Interpretation Practice, New Method Technology of EM Practice, Gravity Magnetic Data Processing and Interpretation Practice, Ground Penetrating Radar Data Acquisition and Processing Practice, Engineering Seismic Exploration Practice, Logging Data Processing and Interpretation Practice, Geological Teaching Practice (Zigui) A, Geophysical Teaching Practice (Beidaihe) A, Graduation Practice, Graduation Design (Thesis), etc.

Duration: Four years.

Conferred Degree: Bachelor of Engineering

Related majors: Geophysics, Resource Exploration Engineering, Geological Engineering

勘查技术与工程专业（勘查地球物理方向）课程教学计划表

Teaching schedule for major of Exploration Techology & Engineering

课程类别 Course type		课程编号 Course code	课程名称 Course name	学分 Crs	学时 Hrs	学时分类 Credit Hours		先修课程 Prerequisite courses	学期学分分配 Semester Credits							
						讲课 Lec.	实验 Lab.		一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th
通识教育课General Education Courses	必修Compulsory	11706200	马克思主义基本原理 Basic Principles of Marxism	3	48	48				3						
		11706500	毛泽东思想与中国特色社会主义理论体系概论 Introduction to Mao Tse-tung Thought and The Theoretical System of Socialism with Chinese Characteristics	4	64	64						4				
		11711800	中国近现代史纲要 Introduction to Modern & Contemporary History of China	2	32	32					2					
		120002*0	思想道德修养与法律基础 Cultivation of Ethics and Fundamentals of Law	3	48	48			1.5	1.5						
		113076*0	体育 Physical Education	4	144	144			1	1	1	1				
		109116*0	大学英语 College English	12	192	192			3	3	3	3				
		11918902	C 语言程序设计 B The C Language Programming Design (B)	2.5	40	40					2.5					
		20612300	勘查地球物理导论 Introduction to Exploration Geophysics	1	16	16			1							
		14300100	军事理论 Military Theory	2	32	32			2							
	选修Elective	总计 12 学分，含创新创业选修课“社会调查”2 学分，跨学科选修课不低于 6 学分。“形势与政策”课程作为限选课由马克思主义学院实施		12	192											
		小计 Sum		**45.5**	**808**	**616**			**8.5**	**8.5**	**8.5**	**8**	**0**	**0**	**0**	**0**
学科基础课 Disciplinary Fundamental Courses		212127*1	高等数学 A Advanced Mathematics (A)	11.5	184	184			5	6.5						
		20115000	地质学基础 Foundation of Geology	4.5	72	56	16		4.5							
		21120801	测量学 A Survey (A)	2.5	40	30	10		2.5							
		20113100	矿物岩石学 A Mineralogy and Lithology (A)	3	48	48				3						
		21208000	线性代数与矢量分析 Linear Algebra and Vector Analysis	3	48	48				3						
		212130*2	大学物理 B Physics (B)	7	112	112				3.5	3.5					

课程类别 Course type	课程编号 Course code	课程名称 Course name	学分 Crs	学时 Hrs	学时分类 Credit Hours		先修课程 Prerequisite courses	学期学分分配 Semester Credits							
					讲课 Lec.	实验 Lab.		一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th
	212132*1	物理实验 A Physics Experiments (A)	3.5	56		56			2	1.5					
	21213502	概率论与数理统计 B Probability and Statistics (B)	2.5	40	40		高等数学 A			2.5					
	20104002	构造地质学 B Structural Geology (B)	3	48	34	14				3					
	21201901	复变函数与积分变换 Complex Function and Integral Transform	3.5	56	56		高等数学 A			3.5					
	21206400	数学物理方程 Equations of Mathematical Physics	3	48	48		复变函数				**3**				
	21206600	数值分析 Numerical Analysis	3	48	48		高等数学 A				**3**				
	21200700	场论 Potential Field Theory	3.5	56	56		大学物理 B 数理方程					**3.5**			
	小计 Sum		**53.5**	**856**	**760**	**96**		**12**	**18**	**14**	**6**	**3.5**	**0**	**0**	**0**
专业主干课 Core Major Courses	20711002	数字信号处理 B Digital Signal Processing (B)	3	48	40	8	复变函数与积分变换				3				
	20609600	弹性波理论基础 Foundation of Elastic Wave Theory	3	48	48		高等数学 A 大学物理 B 场论 数学物理方程				3				
	20609700	重力勘探 Gravity Exploration	2	32	32							2			
	20609800	磁法勘探 Magnetic Exploration	2	32	32							2			
	20609900	电法勘探原理 Principles of Electrical Exploration	2.5	40	40							2.5			
	20610000	地震勘探原理 Principles of Seismic Exploration	2.5	40	40							2.5			
	20615600	电（磁）法资料处理与解释 Electromagnetic Data Processing & Interpretation	2.5	40	28	12	电法勘探原理						2.5		
	20610300	地震资料采集与处理 Seismic Data Acquisition & Processing	3.5	56	40	16	地震勘探原理						3.5		
	20602600	地震勘探资料解释 Seismic Data Interpretation	2	32	20	12	地震勘探原理						2		
	20610400	地球物理测井 Geophysical Logging	3.5	56	52	4	大学物理 B						3.5		
	20609000	重磁资料处理与解释 Gravity and Magnetic Data Processing and Interpretation	2	32	20	12	重力勘探 磁法勘探						2		
	小计 Sum		**28.5**	**456**	**392**	**64**		**0**	**0**	**0**	**6**	**9**	**13.5**	**0**	**0**
专业选修课 Elective Major Courses		具体见专业选修课列表	17	272											

课程类别 Course type	课程编号 Course code	课程名称 Course name	学分 Crs	学时 Hrs	学时分类 Credit Hours		先修课程 Prerequisite courses	学期学分分配 Semester Credits							
					讲课 Lec.	实验 Lab.		一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th
合计 Total			**144.5**	**2392**	**1768**	**160**		**20.5**	**26.5**	**22.5**	**20**	**12.5**	**13.5**	**0**	**0**
实践环节 Practices	44300200	军事训练 Military Training	2	2 周				2							
	41919002	C 语言课程设计 B Programming for C Language (B)	1.5	1.5 周						1.5					
	40614910	地球物理勘探实验（1） Geophysical Exploration Experiment 1	1.5	1.5 周			重、磁、电、震、测井原理及数据采集					1.5			
	40614920	地球物理勘探实验（2） Geophysical Exploration Experiment 2	1.5	1.5 周									1.5		
	40615000	地震资料处理与解释实习 Seismic Data Processing & Interpretation Practice	2	2 周			地震资料处理与解释							2	
	40615100	电磁法新方法技术实习（高密度电法、瞬变电磁、管线探测） New Method and Technology Practice	2	2 周			电（磁）法资料处理与解释						2		
	40615200	重磁资料处理和解释实习 Gravity and Magnetic Data Processing and Interpretation Practice	1	1 周			重磁资料处理与解释						1		
	40615300	地质雷达数据采集与处理实习 GPR Data Acquisition and Processing Practice	1	1 周			大学物理场论						1		
	40615400	工程地震勘探实习 Engineering Seismic Exploration Practice	1	1 周			地震勘探						1		
	40615500	测井资料处理与解释实习 Geophysical Logging Data Processing & Interpretation Practice	1	1 周			地球物理测井						1		
	41120901	测量教学实习 A Survey Practice (A)	1	1 周			高等数学 A	1							
	40115701	地质教学实习(秭归) A Geological Practice Teaching (Zigui) (A)	4	4 周			地质学基础 矿物岩石学 A				4				
	40614800	地球物理教学实习（北戴河）A Geophysics Practice Teaching (A)	5	5 周			测量学 A 重、磁、电、震专业主干课						5		
	40613800	毕业实习 Major Practice for Graduation	8	8 周											8
	40613900	毕业设计 Bachelor Thesis	8	8 周											8
	小计 Total		**40.5**	**40.5 周**				**3**	**0**	**1.5**	**4**	**1.5**	**12.5**	**2**	**16**
分学 Aut	ZZ35S	社会调查 Social Investigation	2												

课程类别 Course type	课程编号 Course code	课程名称 Course name	学分 Crs	学时 Hrs	学时分类 Credit Hours		先修课程 Prerequisite courses	学期学分分配 Semester Credits							
					讲课 Lec.	实验 Lab.		一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th
		其他(学科竞赛、发明创造、科研报告) Others (Contest, Invention, and Scientific Presentation)	3												
	小计 Total		**5**												
总计 Total			**191**	**2408+ 40.5 周**	**1768**	**160**		**23.5**	**26.5**	**24**	**24**	**14**	**26**	**2**	**16**
可开出专业选修课列表 Elective Courses in Major	20615700	Matlab 语言及应用 MATLAB Programming and Its Application	2	32	20	12						2			
	20606100	岩石物理学 Rock Physics	2	32	32									2	
	20615900	工程地震勘探 Engineering Seismic Prospecting	1.5	24	24									1.5	
	20607600	地震沉积相解释 Seismic Sedimentary Facies Interpretation	1.5	24	24									1.5	
	20604000	海洋地球物理概论 Introduction to Marine Geophysics	1	16	16									1	
	20604800	能源地震勘探新方法技术 New Method and Technology of Energy Resources Seismic Exploration	2	32	32									2	
	20606300	重磁勘探新方法技术 New Method and Technology of Gravity & Magnetic Exploration	1.5	24	24									1.5	
	20611700	地球物理反演概论 Introduction to Geophysical Inversion	2	32	24	8								2	
	20616000	管线探测与高密度电法原理 Pipeline Detection & High Density Resistivity Method Principles	1.5	24	24									1.5	
	20610600	大地电磁测深 Magnetotelluric Sounding	1	16	16									1	
	20610700	瞬变电磁法 Transient Electromagnetic Method	1	16	8	8								1	
	20605400	探地雷达方法原理及应用 GPR Principles & Applications	1	16	16									1	
	20601000	地面核磁共振方法与应用 Surface NMR Method and Its application	1	16	16									1	
	20604300	计算地球物理 Computational Geophysics	2	32	32									2	
	20605900	现代地球物理仪器及应用 Modern Geophysical Instruments And Their Applications	1	16	12	4								1	

课程类别 Course type	课程编号 Course code	课程名称 Course name	学分 Crs	学时 Hrs	学时分类 Credit Hours		先修课程 Prerequisite courses	学期学分分配 Semester Credits							
					讲课 Lec.	实验 Lab.		一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th
	20216000	矿床学 B Mineral Deposit Geology (B)	4	64	50	14								4	
	20214804	石油及天然气地质学 D Geology of Oil and Gas (D)	2.5	40	40									2.5	
	20508400	工程地质学基础 B Foundation of Engineering Geology (B)	2	32	32									2	
	20217100	海洋地质学 Marine Geology	3	48	48									2	
	20616100	地球物理科技论文写作 Geophysical Scientific Writing	1	16	16										1

注：通识教育选修课学分和创新创业自主学习学分未列入具体学期。

勘查技术与工程专业（勘查地球物理方向）课程分类统计

	通识教育课程 General Education Courses		学科基础课 Disciplinary Fundamental Courses	专业主干课 Major's Core Courses	专业选修课 Elective Courses in Major	实践环节 Practices	创新创业自主学习 Autonomous Learning	学时总计 Total Hour	学分总计 Total Credits
	必修	选修							
学时/学分	616/33.5	192/12	856/53.5	456/28.5	272/17	40.5 周/40.5	5	2392+40.5 周	190
学分所占比例	23.95%		28.16%	15%	8.95%	21.32%	2.63%		100%